THE BUILDER

A RECORD OF ARCHITECTURE AND CONSTRUCTION.

WITH WHICH IS INCORPORATED THE "BRITISH ARCHITECT."

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ART AND MEASUREMENT.

WE welcome the letters from Mr. Jay Hambidge and other correspondents which appear in our columns on the subject of dynamic symmetry, and have no disposition to undervalue inquiries which are not without interest, but which have not the importance which Mr. Hambidge claims for them. Anything which at a time of so much lawlessness and caprice in art tends to substitute law and discipline in our thoughts about it, works for good, and our criticism is not directed against the veracity of Mr. Hambidge's measurements, which we accept as substantially correct. We never doubted that beauty rested on law, and that dynamic symmetry is inherent in a work of art. But when Mr. Hambidge rather truculently demands that we should keep to fact, we have a right to demand that his own facts shall include what is embraced by art, and not merely the least part, and what he chooses to regard as the facts. Anything in life which transcends the known, and for which his theory is quite inadequate, he regards as "hysteria." He is intolerant of such phrases as "intuitive" and "spiritual expression," and would replace them by his theory. If he can make the incommeasurable for which these words stand into a commeasurable through his theory he will achieve what is at present lacking in his calculations, which embrace only the "least part of art." He brushes all this aside; he is not "interested in art, but in design." "Design, as I am considering it, has for the moment very little, if anything, to do with æsthetics." There lies a dangerous assumption in dwelling too entirely on the art of the Greeks. It must always be remembered that the civilisation occurred before the dawn of liberty. The pliability and scope of Greek literature is greater than that of its art. The "preciseness" of Greek design is not altogether a virtue, but a limitation. Is Mr. Hambidge mistaken in finding the highest development of architecture in Greek art? It is perhaps just its limitations which enable Mr. Hambidge to reduce it to a system. Though even here he is more likely to demonstrate his theory on a Greek vase than on the Venus of Praxiteles. In order to exalt his theory he exaggerates their craft practice, which lacked the extent of variation which is found in later developments, and is not comparable in content with the Gothic. That the Greeks made use of some such measurements we do not doubt. The religion of the time required the temple to be designed on a certain plan. But Phidias was working two whole centuries before Euclid systematised mathematics sufficiently to treat of incommeasurable areas. It is important to remember that in art it is not only fact which counts, and to which Mr. Hambidge asks us to keep. The standard he claims leaves out of account that in a building or bronze, a statue or a vase, what matters is how it looks—appearance, how it satisfies the eye. A demand which it takes more than a system of areas or lines to reconcile to the claims of beauty. By measurement we shall reach to the formality of a botanist's diagram of a flower, but not to its loveliness. It is just these subtle variations from the known within dynamic symmetry which are the interest and beauty of trees, buildings, sculpture or pottery. "The little more and how much it is." But Mr. Hambidge would enclose this unknown within the little space his theory covers. There is this same unconscious symmetry in plant form, similar facts manifesting themselves, though their source is unknown. We call it unconscious for this reason. Does there not lie in this just the disparity between what Mr. Hambidge's theory encloses and art contains? There is no system which will explain the working of the creative mind whether in nature or in man; or, shall we say, that it is the least part that can be learned? We can strengthen our work by "good craftsmanship, the mechanics of technique," and knowledge of past methods, but we cannot enclose the unknown within what we can see with our eyes. Yet Mr. Hambidge would have us do this and writes contemptuously of "the old men who are comfortably seated before the fire, peacefully resting on their past efforts," and adds that "the young men refuse to look at it that way." He must give us credit for a desire for truth equal with himself. The disparity which lies between us—and it is a grave one—does not grow out of laziness, but fear lest the larger truths which go to the making of "a superlative art production" should be obscured by his theories at a time when it is so urgent to see art comprehensively and whole. We do not find it so easy as Mr. Hambidge. We do not think that because we can measure a skeleton through the application of his theory that we can measure art by it. We credit his theory with what it includes, but that which would determine the prospects of art must include a great deal more. When Mr. Hambidge contrasts the "ingenious and simple-minded Americans," in a way unfavourable to ourselves, it is because he does not understand our point of view, which will not be diverted by short cuts and easy roads from the problems which surround the future welfare of art. And the young men to whom Mr. Hambidge so confidently appeals do not find it "caprice" only that we should not believe that to substitute his theory for the "five orders and government renaissance" will give us all we need, because it will not. It is in the growth of liberty, the "spiritual" freedom, which Mr. Hambidge disclaims, the disentanglement of life from its burden of scepticism and material aims which will restore art, because it will restore life. Ruskin was only before his time. The spirit of the Gothic will return, though not its form, because there is contained in it a liberty, a freedom to which political systems and outward changes do not reach. Religion is at the back of life as it is of art; and to that necessity the burden and the tragedy of life is bidding us return. Greek art was the reflection of a life which is not ours. Too much must not be deduced from it. It contradicts in its expression present conceptions which grow towards the realisation of personal liberty.

The young men know this, and the student to whom Mr. Hambidge appeals is alive to the call of a greater responsibility. We almost envy Mr. Hambidge his complacency. He would ask us to rest the future of art on experience and archæology, instead of initiation and life; a short cut to a false security in regard to things divine. The young men "will not look at it that way," in spite of the evidence of professors and teachers, and they will be right in not doing so. It may do for the art school, but not for art; for it is a science of art which is a contradiction in terms. We criticise neither the interest or general accuracy of Mr. Hambidge's measurements as far as they go, but deny the conclusions which he would seek to form out of them. Does not the ghost of the "pyramid inch" haunt this new controversy, so eagerly debated years ago and now so much forgotten?

Mr. Eisen, another correspondent, refers to the diagrams of two Greek mirrors in the "Diagonal," and says that we have only to glance at them to see the principle of their construction, and concludes, we suppose, that they were designed on this system. These principles are, no doubt, inherent in beauty, but would Mr. Eisen scrap the creative endowment of the artist, to which the beauty of the mirror is attributable, to manufacture it on this system? It is, in any case, but a slight variation from what has been taught in schools of art for years. The whole outlook shows an impatience of endowment, the source of which it cannot follow. But life rests on a background vaster than the known, and it is only in relating ourselves to this unseen, to the "divine liberty" which such an aspiration holds within it, that we shall reach to the beautiful and the true.

NOTES.

Unification of the Profession.

A letter has been sent to the President of the Royal Institute of British Architects by the North Wales Architectural Society, expressing satisfaction that the Report of the Charter Committee of the Institute has been adopted, and that steps are being taken to devise a scheme of unification for the profession. The letter is signed by some well-known Welsh architects, and contains the following excellent observations, which no doubt express the views of the provincial societies generally:—"We realise that the problem is a difficult one, but the obstacles are not insuperable if only the work is undertaken in the right spirit. The 'Mistress Art' is a great art, notwithstanding the weaknesses of those who practise architecture, and we long to see pretentious and delusive professionalism give place to a wider field of vision and thought. We venture to express the hope that the men appointed on the new Committee to be set up by the Special General Meeting shall be men of imagination, thinkers, creators, with a love of architecture in its highest form, and a fine and true conception of its worth as an ennobling factor in the world. Living in far-away Wales as we do, we find it most difficult to attend meetings of the Institute, but the subject under consideration is of such importance that we feel we should like to send the Institute this expression of the pleasure we experience in learning that, at last, a real effort is to be made for the unification of the profession of architecture."

Royal Academy Ateliers

A scheme has been prepared under the general supervision and control of the Royal Academy for the co-ordination of advanced architectural training in a group of ateliers which will work on the Beaux Arts system, and will be open to students day and night. The main purpose of the scheme is to promote the study of design on the lines which the Beaux Arts method has proved to be so valuable, and it is intended to meet the requirements of students who are working in offices during the daytime and who will seldom have more than the evening time to spare. Subjects in design will be set every two months, and the drawings submitted in competition between the ateliers will be regularly exhibited to the public. It is hoped that an annual exhibition of these drawings and of the winning designs in the competitions may be arranged at the Royal Academy. As in the Paris ateliers, subjects will be divided into first and second classes, and students will be required to win a minimum number of "mentions" in design before passing from the first to the second class. Students who have taken a recognised school course will be admitted to an atelier without entrance examination. The whole group of ateliers is to be controlled by an Atelier Council appointed by the Council of the Royal Academy, and it is expected that diplomas will be granted by the Atelier Council to fully-qualified students in the first class who have passed the necessary tests of distinction. The group will initially consist of "The First Atelier," the Architectural Association, and the London University Atelier. Intending students should write for particulars to the Secretary, Architectural Ateliers Committee, 34, Bedford-square, W.C.

Dynamic Symmetry and Expression.

Mr. Hambidge says of the "counters of later-day æstheticism," such as "intuitive expression" and "spiritual expression," that they have logical results as unqualified liberty and the recent hysteria in art. If the suggestion is that we should all have been doing better if we had thoroughly studied dynamics or dynamic expression, we should be inclined to ask how it is that living forces in modern architecture have done so much without those aids. The work of Bentley, Norman Shaw, Philip Webb, the late George Gilbert Scott, J. D. Sedding, Stevenson, Austin, Johnson, and others now dead, seems to prove a good deal for intuitive expression, and nothing for the dynamic theory. The discussion about this matter is interesting, as is everything which sharpens the wits and draws forth strong expressions of belief, but we should indeed regret if it led our students of art to believe that in a study of mathematics they will find a guidance in art, or anything much beyond a reverential regard for the right distribution of forces, plan and elevation.

Art and Mathematics.

A telling rejoinder to Mr. Hambidge appears in the R.I.B.A. *Journal* from Mr. A. Tryston Edwards, A.R.I.B.A., who says: "If there is a connection between art and mathematics it is a conclusion highly insulting to the dignity of art that such very elementary calculations should be deemed sufficient to elucidate the secrets of design. Mr.

Colorado Springs Cottages. Erected at Longniddry, near Edinburgh, in 1917, for disabled Scottish soldiers.

Hambidge entirely fails to tell us *why* a rectangle with sides having the proportion of $\sqrt{2}$ to 1 is better artistically than one with sides having the proportion of, say 20 to 13. The distinction which he really draws is that between the commensurate and the incommensurate; but this has nothing whatever to do with the distinction between static and dynamic."

Southport School Competition.

A CORRESPONDENT writes in reference to our note last week: "I suppose it would only revive an old controversy to ask for how long and why architects will be such fools as to undertake the enormous amount of collective waste energy involved by the competition system. I was informed that there were several hundred designs expected to be received in this competition. Such conditions do not, I think, obtain in any other branch of work. It was expected that after the war this state of affairs would improve, but there now seems to be no prospect of it. The remedy might be fairly simple, but it must come from within the profession, and this ought to be a favourable time to advance the question. The chance of work seems to carry with it almost unlimited endurance with regard to officialism. General opinion no doubt agrees that the longer the time taken to fix the award in such competitions the more chance there may be of the result being in some way influenced; one hears such remarks as 'no one out of Lancashire will get it,' or 'a London man will be sure to get the award,' and I suggest that in future a short time limit for the award should be embodied in the conditions of competitions."

London Improvement.

WE are glad Mr. T. E. Collcutt has returned to the charge as regards London improvements. His suggestions, which we publish to-day, have much practical significance, even if their architectural importance on the north side of the river were much modified. He very rightly emphasises the neglect there has been of proper bridge communication between the north and south sides of the river, but, given proper intercommunication we might suppose that the value of land on the south side would rise to such a point that far less would be afforded for workmen's dwellings than he has suggested.

Dr. Addison and Housing.

WE are told that the housing difficulty is being overcome and that the badly-needed dwellings, not only for the working classes but the middle classes as well, will be provided—if we only have patience. We hope it may be so, but though Dr. Addison was in an optimistic mood in his remarks in opening the Building Trades Exhibition, what he had to tell us suggested failure rather than success. With the knowledge in our minds of the accumulated arrears of the past six or seven years, and of the yearly addition which is being made to the number, there is little comfort to be obtained in the statement that, having sanctioned tenders for 100,000 houses, Dr. Addison's Department is now marking time a little. Such an observation does not appear to justify the optimism we refer to, though we may all agree that "to continue sanctioning schemes is useless unless the houses are built."

Design for the Zeebrugge Memorial.

By Mr. LUCIEN COPPÉ, Architect; Mr. GUSTAVE PUCKERY, Sculptor, of Bruges.

[This design, which was submitted in the recent competition for the Zeebrugge Memorial, shows various incidents in the blocking of the Bruges Canal by the sinking of the *Vindictive*.]

The War Memorial of the Ecole des Beaux Arts.

WE have received from the Royal Institute of British Architects particulars which the Ministry of Public Instruction and Fine Arts in Paris has issued of the formation of a Committee for the erection in the Ecole des Beaux Arts of a monument to the students and members of the school who laid down their lives during the war. A subscription list has been opened to obtain funds for the erection of the monument, and from the copy of the appeal which is being circulated we take the following:—"The Professors of the National School of Fine Arts, re-united under the presidency of their venerated Director, M. Leon Bonnat, have decided to elect a committee charged with the erection in the school itself of a monument to the pupils and members of the staff killed in the war. . . . At the head of the first list of the subscribers will figure the professors and the most intimate friends of the school who wish to associate themselves with us in order to realise this worthy object. Their co-operation will bring in many others in France as well as abroad." Subscriptions should be sent to M. Pontremoli, Treasurer of the Committee, 1, Rue Spontini, Paris.

Plan and Elevation.

A WELL-KNOWN writer the other day was apparently insisting on the inevitable result of plan on elevation, as though one would be driven to a certain elevational expression given a certain lay-out of plan. Of course, any student of building design knows that the plan of even the simplest cottage may be evolved in such different forms of elevation as to give opportunity for an immense variety of individuality.

GENERAL NEWS.

Professional Announcements.

Mr. G. C. Ferrey, P.A.S.I., building and quantity surveyor, has removed to 34A, Coney-street, York.

Mr. Osmund Bentley, architect, who, prior to the war, had offices at 13, John-street, Adelphi, W.C., has now taken offices at 1, Pump Court, Temple, E.C. 4. He would be glad to receive manufacturers' lists for office reference.

The Surveyors' Institution.

Mr. H. M. Cobb, O.B.E., Member of Council, and Mr. J. D. Wallis, Member of Council, have been nominated to give evidence on behalf of the Surveyors' Institution before the Select Committee of the House of Commons on Increases of Wealth (War). Mr. Cobb will deal more particularly with the proposals of the Board of Inland Revenue in their effect on rural property, Mr. Wallis dealing with the urban and industrial side.

Mr. J. Cuthbert Lake, F.S.I., has been asked to give evidence on behalf of the Institution before the Departmental Committee on the Rent, &c. (Restrictions) Acts. Mr. Lake has been put into possession of the views of the County Branches of the Institution on this subject.

Victoria and Albert Museum Memorial.

A memorial tablet in honour of members of the Museum staff who died on active service during the war has just been completed by Mr. Eric Gill. Carved in a single slab of Hopton Wood stone, five feet high, the tablet is of a simple architectural form. The lunette-shaped top contains a branch of laurel in low relief, and, below, in incised lettering is an inscription in red: "In Honour of those who gave their lives for their Country, Serving the King by Land and Sea, in the Great War, MCMXIV–MCMXVIII," followed by the names of sixteen men.

Civilian War Honours.

The following appointments to the Order of the British Empire are announced in addition to those given in our last issue:—

To be Knight Commander (K.B.E.).

Lawrence Weaver, C.B.E., Commercial Secretary to the Board of Agriculture.

To be Members (M.B.E.).

J. W. Paterson, Assistant Architect (Second Class), H.M. Office of Works.

A. Scott, Assistant Architect (First Class), H.M. Office of Works.

P. M. Stratton, Assistant Architect (Second Class), H.M. Office of Works.

D. Thomson, Acting Assistant Architect, H.M. Office of Works.

Lieut.-Col. H. P. Cart de Lafontaine has been appointed an Officer of the Order for his work with the Imperial War Graves Commission.

R.I.B.A. Housing and Town-Planning Exhibition.

The Exhibition of town plans and house designs at the Royal Institute of British Architects will be closed this week, as the Galleries are required for the final examination of the British School at Rome.

The National Gallery.

Two Apostles by Ugolino da Siena, another fragment of the altarpiece of S. Croce, is now hung in the Vestibule of the National Gallery, having been presented through the National Art Collections Fund by the Earl of Crawford and Balcarres. In Room XX is hung a landscape by Cornelis Vroom, signed 1626. This artist (b. 1600, d. 1661) is of the generation before J. van Ruisdael. This picture has been presented by Mr. Robert C. Witt, through the National Art Collections Fund.

Examinations in Art.

The Board of Education announces that the Draft dated January 14, 1920, of the Regulations for the Superintendence of Examinations in Art has been published for the required period, and has now been confirmed by the Board without substantial amendment, though with a slight alteration in the wording of paragraph 1 and a change in the title. The Draft now becomes Art Examinations (Superintendence) Regulations, 1920, dated March 26, 1920, and copies can be purchased through any bookseller (price 1d.) or directly from H.M. Stationery Office, Imperial House, Kingsway, W.C. 2 (price by post, 1½d.).

Newsvendors' Benevolent Institute.

The report of the 81st Annual Meeting of the Newsvendors' Benevolent Institution shows that the Society is doing valuable work under the Presidency of Viscount Burnham, and owing to the combined efforts of Sir Horace Marshall, the senior trustee, Mr. Frank Lloyd, and many others, the finances have been greatly reinforced. An award of £10, as a peace gift, has been made to each of the pensioners.

Excavations at Windsor.

Further discoveries have been made recently by Capt. Vaughan-Williams, who is makng excavations in Windsor Great Park. The site is presumed to be that of Edward the Confessor's Palace, and what is supposed to be the dedication stone of a Saxon place of worship has now been found. The *Times* states that a kitchen and banqueting hall, from 90 ft. to 95 ft. long, the remains of what might have been Roman baths, and the floor of the portico of the Royal apartments have also been found. Capt. Vaughan-Williams is of the opinion that these discoveries confirm the statement of Mr. Forestier that this was the site of Roman villas and baths. On the site of the chapel which was discovered some time ago an extension of the walls has been found ending in a square foundation, which was evidently a small tower or belfry.

COMPETITION NEWS.

Bradford-on-Avon (Wilts.).

For the War Memorial Committee.—Design for a war memorial. Premium 25 guineas. Sending-in day, May 8. (See our issue for March 5.)

Hornsey.

For the War Memorial Committee.—Designs for a war memorial. Sending-in day April 20. (See our issue for March 5.) The R.I.B.A. and the Society of Architects advise their members to take no part in the competition until conditions are revised.

Ilfracombe.

The premiums in connection with the Ilfracombe Concert Hall Competition have been awarded as follows:—

(1) Mr. Allen T. Hussell, F.R.I.B.A.
(2) Mr. William Leah, Lic.R.I.B.A.
(3) Mr. Stanley J. Hellier, P.A.S.I.

Peterborough.

For the War Memorial Committee.—Designs for an infirmary. (See our issue for April 9.)

Arthuret.

The R.I.B.A. and the Society of Architects call attention to the fact that the conditions of the Arthuret War Memorial Hall Competition are unsatisfactory. Members are advised to take no part in the Competition.

Chatham.

Mr. E. Guy Dawber, F.R.I.B.A., who was appointed by the President of the R.I.B.A. to adjudicate upon the plans submitted in the Chatham housing lay-out competition, has now issued his report. The premium has been awarded to Mr. W. Harding Thompson, A.R.I.B.A., of 38, Museum-street, London, W.C.

Willesden.

For the Willesden Hospital Building Committee.—Designs for a new hospital. Names to be submitted by April 24. (See our advertisement pages to-day.)

A Minar on the Masjid at Dholka.

Measured and drawn by Mr. P. R. Udwadia

[The measured drawings of Indian architecture given on this and other pages are the work of Mr. P. R. Udwadia, a State Technical Scholar in Architecture of the Government of India.]

CORRESPONDENCE.

Dynamic Systems of Proportions.

SIR,—The highly nervous and adverse criticism of the dynamic symmetry in the February 6 issue of the *Builder* will, I fear, deter many from investigating for themselves, although it is quite apparent that the critic had neither mastered the new theory nor investigated it in a scientific way. With his own discoveries of the Greek measurements uppermost in his mind, he discusses and dismisses the new subject in an authoritative manner that is apt to mislead and discourage many who would otherwise have become intensely interested. On this side of the Atlantic, where the dynamic system of proportions has been studied and verified ever since it was first made known two years ago, scores of artists, designers and architects are now applying it to their own work with great benefit both to the work and to themselves. Among others, Dr. Caskey, curator in the Greek Department of the Boston Museum of Fine Arts, has measured, analysed and rectangulated several hundred Greek vases of the 6th and 5th centuries B.C. with the result that he, and all who have studied his work, are satisfied that the theory of Greek proportions, according to Mr. Hambidge, is absolutely correct, as well as indispensable in judging Classical Greek art at its best. The diagrams of the vases with their analyses made by Dr. Caskey were exhibited at the annual meeting of the Archæological Institute of America held in the Columbia University in 1919, and all interested had then the opportunity to ascertain the correctness of the method and the very convincing proofs illustrated by these examples. In his lectures, as well as in the "Diagonal," Mr. Hambidge has limited his examples to objects of the Classical Greek period, and has concluded that the dynamic system was practically discontinued in Greece in the middle of the 4th century B.C., after which time it was practised only sporadically in isolated localities elsewhere. But Mr. Edward B. Edwards, the noted artist, one of the first to recognise the importance of the Hambidge system, and who himself has independently added discoveries of his own in this very line, has measured, analysed and rectangulated with the greatest possible precision various vessels of the 1st century B.C. to the 1st century A.D., which are accurately based and designed upon the same system, the disappearance of which must, therefore, be advanced. This fact can be confirmed by the present writer, who, during his investigations of Hellenistic, Syrian and so-called Samian vessels, has been able to show that the majority of these vessels are based upon the system in more or less the same manner as the Greek vases of the Classical period. So far, however, not a single vase or other object has been discovered which could indicate that the use of the system extended into the 2nd century A.D.

A year ago the earlier students of the dynamic system had so far advanced in the practical use of the system that they held an exhibition of their own work in the rooms of the Architectural League in New York. During the meeting, each one of the exhibitors demonstrated in what manner the system could be used for his especial purpose, and the benefits that would result from such use. These exhibitors comprised artists as well as artisans of all kinds, such as painters, designers, silversmiths and architects, each of whom had brought along finished specimens of his respective work. All these artists who had made practical use of the system declared themselves convinced of its truth and usefulness, and of the valuable results of its application to modern art. This took place one year before the dynamic system was made known in England, and since that time its votaries have grown from fifty odd to thousands. There is, thus, no doubt among scientists and practical artists on this side that the system as applied to painting, architecture and allied arts is actually what its re-discoverer claims it to be. They are, moreover, convinced that a proper use of this system will be the means of improving their own art without inflicting upon it that regrettable stereotypy which has always been the ultimate result of academic styles.

In his article in the *Builder*, the critic makes various statements which may readily be shown to be either misleading or erroneous. For instance, "he does not think that two experts would be likely to rectangulate forms in the same way." Such an assertion could never have been made by anyone who had experimented for himself upon perfectly preserved objects, because such can only be measured in one way and with one result, and if the measurements of the two experts are equally correct, then their rectangulations of an object must of necessity be in all essentials the same.

Another statement by the critic which requires considerable modification is that "buildings erected for use cannot by their very nature be designed by machinery; (!) . . . . because architecture responds first of all to the data of need and material conditions." This statement shows conclusively that the critic never tried to apply the system in his own work, but simply theorises without comprehending in what manner and to what extent the system could be made useful, because, besides tenement houses, office buildings and factories, which are everywhere erected with little or no regard to beauty, there are numerous monumental structures, such as memorial halls, substructures of statuary, fountains, &c., which are primarily erected for the purpose of commemoration and embellishment. All such structures could be made to conform to the rules of the dynamic system and would be greatly benefited by it. The manner in which minor objects might be improved by the use of the system is sufficiently illustrated by the analyses and diagrams of two Greek mirrors, in the "Diagonal," and any designer of ability need but glance at these diagrams in order to grasp the principle of their construction.

The curious reasoning of the critic is, however, best illustrated by his verdict that "the ancient masons had other things to think of than the application of the dynamic system to their work." There are absolutely no valid premises upon which to base such an assertion, which is also disproven by the masterpieces these masons have left and which continue and must continue to be the objects of our admiration and study. Indeed, these masons must have considered the question of correct proportion and design as the prime necessity of their art, which, unfortunately, does not seem to apply to the modern architect, who considers the practical and business part of his work as more important than the artistic features.

The condemnation of a new theory or system before it is properly tested and tried is an error that is to be deeply regretted and which must always retard progress. The only proper way to prove and disprove a theory or system is to master it first and theorise afterwards. And only the conclusions of those who have done so can carry any weight in the opinion of those who are absolutely unprejudiced.

GUSTAVUS A. EISEN.

New York City

[Another letter on the subject is unavoidably held over until next week.—ED.]

Exhibitions.

SIR,—With reference to your article "Exhibitions: Their Theory and Purpose," on page 431 of your issue of April 9, may I point out that the Royal Sanitary Institute held its first Health Exhibition at Leamington in 1877? Since then, the Health Exhibition has been held at Croydon, Exeter (2), Dublin, Leicester, York (2), Bolton, Worcester, Brighton (2), Portsmouth, Liverpool, Newcastle-upon-Tyne, Leeds, Birmingham, Southampton, Manchester, Bradford, Glasgow, Bristol, Cardiff, Belfast and Blackpool. A special Smoke Abatement Exhibition was held in London in 1905, and two for School Buildings and Furnishing in London in 1905 and 1907, the latter being held in connection with the Second International Congress on School Hygiene. The Exhibition this year is being held in Pingley Hall, Birmingham, from July 19 to August 5, in connection with the 31st Congress of the Institute.

E. WHITE WALLIS, *Secretary*,
The Royal Sanitary Institute.

Economics in Relation to the Present Crisis.

SIR,—Will you permit me space to reply to your correspondent, Mr. R. Midworth, in your issue of April 9? I was exceedingly interested in the last paragraph, and I would suggest that he bring the matter before his union with a view to ascertaining if it is possible to offer any inducement to employers if the workmen are guaranteed (say) 12 months' continuous employment. As matters stand at present it is more usual for workmen to be stood off owing to non-arrival of materials, rain, frost and other matters that occur on many jobs, than for the workmen to be drafted on to other jobs, whereas the man in receipt of a weekly wage, guaranteed for 12 months, would find his way back to the yard with his tools, and from there be drafted to another job. Hundreds of employers are willing to enter into 12 months' contracts with their men, but not so long as it is more to their interest to engage the men on the spot where the work is being done.

It costs money, and oftentimes a lot of money, to ensure continuous employment. If a job is drawing to a close and the nearest job available is ten miles away, the cost at present rates for travelling time and expenses, to say nothing of lodging money and travelling expenses at the week-end to get home and returning to the job, are very heavy. The union leaders have never tried to cope with any problems connected with continuous employment; their one idea has been to press for an increase of the rate per hour until at the present time the increase in that portion of the wages that is for "living" purposes is three times the pre-war standard, and still we are told that nothing can be saved out of it. What the effect will be on the members of the building trade when the spell of unemployment occurs that your correspondent anticipates, it is difficult to forecast. But the question of continuous employment is not beyond solution if properly considered.

Great hopes were entertained when the Labour Exchanges came along that the difficulty was solved, but they have not fulfilled these hopes. Curtailing the hours of work does not help matters, it merely drives the work into the hands of large concerns who are in a position to install machinery to help the work along, and in the decorating trade many thousands of people have done their own work this year; instances are not unknown of workmen becoming master men after the so-called day's work was done, and working late each night and Saturday afternoons.

In my opinion, yearly contracts between employer and employee would go a long way towards a solution of the unemployment troubles referred to, but the employer cannot afford to pay the same rates for continuous employment as for casual employment.

"BUILDER."

A Village War Memorial.

A war memorial at Iwerne Minster was dedicated on Monday last by the Bishop of Salisbury. The memorial was designed by Mr. Gilbert Scott, and stands on an open triangular site in the village. It is carried out in Doulting stone, and consists of a tall shaft on a wide spreading hexagonal base of steps and a seat. The socket stone has three main faces, and into these are let tablets of Hopton stone marble, on which are cut the names of the fallen. On the lower part of the shaft is carved the figure of a soldier, in a niche, standing with reversed arms. The top of the shaft consists of carved tabernacle work, with three open niches, surmounted by a crocketed pinnacle. The niche on the principal face contains the figure of Our Lord on the Cross; while the other two niches are occupied by figures of St. George and Joan of Arc.

GENERAL NEWS.

Professional Announcements.

Mr. G. C. Ferrey, F.A.S.I., building and quantity surveyor, has removed to 34A, Coney-street, York.

Mr. Osmund Bentley, architect, who, prior to the war, had offices at 13, John-street, Adelphi, W.C., has now taken offices at 1, Pump Court, Temple, E.C. 4. He would be glad to receive manufacturers' lists for office reference.

The Surveyors' Institution.

Mr. H. M. Cobb, O.B.E., Member of Council, and Mr. J. D. Wallis, Member of Council, have been nominated to give evidence on behalf of the Surveyors' Institution before the Select Committee of the House of Commons on Increases of Wealth (War). Mr. Cobb will deal more particularly with the proposals of the Board of Inland Revenue in their effect on rural property, Mr. Wallis dealing with the urban and industrial side.

Mr. J. Cuthbert Lake, F.S.I., has been asked to give evidence on behalf of the Institution before the Departmental Committee on the Rent, &c. (Restrictions) Acts. Mr. Lake has been put into possession of the views of the County Branches of the Institution on this subject.

Victoria and Albert Museum Memorial.

A memorial tablet in honour of members of the Museum staff who died on active service during the war has just been completed by Mr. Eric Gill. Carved in a single slab of Hopton Wood stone, five feet high, the tablet is of a simple architectural form. The lunette-shaped top contains a branch of laurel in low relief, and, below, in incised lettering is an inscription in red: "In Honour of those who gave their lives for their Country, Serving the King by Land and Sea, in the Great War, MCMXIV–MCMXVIII," followed by the names of sixteen men.

Civilian War Honours.

The following appointments to the Order of the British Empire are announced in addition to those given in our last issue:—

To be Knight Commander (K.B.E.).

Lawrence Weaver, C.B.E., Commercial Secretary to the Board of Agriculture.

To be Members (M.B.E.).

J. W. Paterson, Assistant Architect (Second Class), H.M. Office of Works.

A. Scott, Assistant Architect (First Class), H.M. Office of Works.

P. M. Stratton, Assistant Architect (Second Class), H.M. Office of Works.

D. Thomson, Acting Assistant Architect, H.M. Office of Works.

Lieut.-Col. H. P. Cart de Lafontaine has been appointed an Officer of the Order for his work with the Imperial War Graves Commission.

R.I.B.A. Housing and Town-Planning Exhibition.

The Exhibition of town plans and house designs at the Royal Institute of British Architects will be closed this week, as the Galleries are required for the final examination of the British School at Rome.

The National Gallery.

Two Apostles by Ugolino da Siena, another fragment of the altarpiece of S. Croce, is now hung in the Vestibule of the National Gallery, having been presented through the National Art Collections Fund by the Earl of Crawford and Balcarres. In Room XX is hung a landscape by Cornelis Vroom, signed 1626. This artist (b. 1600, d. 1661) is of the generation before J. van Ruisdael. This picture has been presented by Mr. Robert C. Witt, through the National Art Collections Fund.

Examinations in Art.

The Board of Education announces that the Draft dated January 14, 1920, of the Regulations for the Superintendence of Examinations in Art has been published for the required period, and has now been confirmed by the Board without substantial amendment, though with a slight alteration in the wording of paragraph 1 and a change in the title. The Draft now becomes Art Examinations (Superintendence) Regulations, 1920, dated March 26, 1920, and copies can be purchased through any bookseller (price 1d.) or directly from H.M. Stationery Office, Imperial House, Kingsway, W.C. 2 (price by post, 1½d.).

Newsvendors' Benevolent Institute.

The report of the 81st Annual Meeting of the Newsvendors' Benevolent Institution shows that the Society is doing valuable work under the Presidency of Viscount Burnham, and owing to the combined efforts of Sir Horace Marshall, the senior trustee, Mr. Frank Lloyd, and many others, the finances have been greatly reinforced. An award of £10, as a peace gift, has been made to each of the pensioners.

Excavations at Windsor.

Further discoveries have been made recently by Capt. Vaughan-Williams, who is making excavations in Windsor Great Park. The site is presumed to be that of Edward the Confessor's Palace, and what is supposed to be the dedication stone of a Saxon place of worship has now been found. The *Times* states that a kitchen and banqueting hall, from 90 ft. to 95 ft. long, the remains of what might have been Roman baths, and the floor of the portico of the Royal apartments have also been found. Capt. Vaughan-Williams is of the opinion that these discoveries confirm the statement of Mr. Forestier that this was the site of Roman villas and baths. On the site of the chapel which was discovered some time ago an extension of the walls has been found ending in a square foundation, which was evidently a small tower or belfry.

COMPETITION NEWS.

Bradford-on-Avon (Wilts.).

For the War Memorial Committee.—Design for a war memorial. Premium 25 guineas. Sending-in day, May 8. (See our issue for March 5.)

Hornsey.

For the War Memorial Committee.—Designs for a war memorial. Sending-in day April 20. (See our issue for March 5.) The R.I.B.A. and the Society of Architects advise their members to take no part in the competition until conditions are revised.

Ilfracombe.

The premiums in connection with the Ilfracombe Concert Hall Competition have been awarded as follows:—

(1) Mr. Allen T. Hussell, F.R.I.B.A.
(2) Mr. William Leah, Lic.R.I.B.A.
(3) Mr. Stanley J. Hellier, P.A.S.I.

Peterborough.

For the War Memorial Committee.—Designs for an infirmary. (See our issue for April 9.)

Arthuret.

The R.I.B.A. and the Society of Architects call attention to the fact that the conditions of the Arthuret War Memorial Hall Competition are unsatisfactory. Members are advised to take no part in the Competition.

Chatham.

Mr. E. Guy Dawber, F.R.I.B.A., who was appointed by the President of the R.I.B.A. to adjudicate upon the plans submitted in the Chatham housing lay-out competition, has now issued his report. The premium has been awarded to Mr. W. Harding Thompson, A.R.I.B.A., of 38, Museum-street, London, W.C.

Willesden.

For the Willesden Hospital Building Committee.—Designs for a new hospital. Names to be submitted by April 24. (See our advertisement pages to-day.)

A Minar on the Masjid at Dholka.

Measured and drawn by Mr. P. R. Udwadia

[The measured drawings of Indian architecture given on this and other pages are the work of Mr. P. R. Udwadia, a State Technical Scholar in Architecture of the Government of India.]

CORRESPONDENCE.

Dynamic Systems of Proportions.

Sir,—The highly nervous and adverse criticism of the dynamic symmetry in the February 6 issue of the *Builder* will, I fear, deter many from investigating for themselves, although it is quite apparent that the critic had neither mastered the new theory nor investigated it in a scientific way. With his own discoveries of the Greek measurements uppermost in his mind, he discusses and dismisses the new subject in an authoritative manner that is apt to mislead and discourage many who would otherwise have become intensely interested. On this side of the Atlantic, where the dynamic system of proportions has been studied and verified ever since it was first made known two years ago, scores of artists, designers and architects are now applying it to their own work with great benefit both to the work and to themselves. Among others, Dr. Caskey, curator in the Greek Department of the Boston Museum of Fine Arts, has measured, analysed and rectangulated several hundred Greek vases of the 6th and 5th centuries B.C. with the result that he, and all who have studied his work, are satisfied that the theory of Greek proportions, according to Mr. Hambidge, is absolutely correct, as well as indispensable in judging Classical Greek art at its best. The diagrams of the vases with their analyses made by Dr. Caskey were exhibited at the annual meeting of the Archæological Institute of America held in the Columbia University in 1919, and all interested had then the opportunity to ascertain the correctness of the method and the very convincing proofs illustrated by these examples. In his lectures, as well as in the "Diagonal," Mr. Hambidge has limited his examples to objects of the Classical Greek period, and has concluded that the dynamic system was practically discontinued in Greece in the middle of the 4th century B.C., after which time it was practised only sporadically in isolated localities elsewhere. But Mr. Edward B. Edwards, the noted artist, one of the first to recognise the importance of the Hambidge system, and who himself has independently added discoveries of his own in this very line, has measured, analysed and rectangulated with the greatest possible precision various vessels of the 1st century B.C. to the 1st century A.D., which are accurately based and designed upon the same system, the disappearance of which must, therefore, be advanced. This fact can be confirmed by the present writer, who, during his investigations of Hellenistic, Syrian and so-called Samian vessels, has been able to show that the majority of these vessels are based upon the system in more or less the same manner as the Greek vases of the Classical period. So far, however, not a single vase or other object has been discovered which could indicate that the use of the system extended into the 2nd century A.D.

A year ago the earlier students of the dynamic system had so far advanced in the practical use of the system that they held an exhibition of their own work in the rooms of the Architectural League in New York. During the meeting, each one of the exhibitors demonstrated in what manner the system could be used for his especial purpose, and the benefits that would result from such use. These exhibitors comprised artists as well as artisans of all kinds, such as painters, designers, silversmiths and architects, each of whom had brought along finished specimens of his respective work. All these artists who had made practical use of the system declared themselves convinced of its truth and usefulness, and of the valuable results of its application to modern art. This took place one year before the dynamic system was made known in England, and since that time its votaries have grown from fifty odd to thousands. There is, thus, no doubt among scientists and practical artists on this side that the system as applied to painting, architecture and allied arts is actually what its re-discoverer claims it to be. They are, moreover, convinced that a proper use of this system will be the means of improving their own art without inflicting upon it that regrettable stereotypy which has always been the ultimate result of academic styles.

In his article in the *Builder*, the critic makes various statements which may readily be shown to be either misleading or erroneous. For instance, "he does not think that two experts would be likely to rectangulate forms in the same way." Such an assertion could never have been made by anyone who had experimented for himself upon perfectly preserved objects, because such can only be measured in one way and with one result, and if the measurements of the two experts are equally correct, then their rectangulations of an object must of necessity be in all essentials the same.

Another statement by the critic which requires considerable modification is that "buildings erected for use cannot by their very nature be designed by machinery (!) . . . . because architecture responds first of all to the data of need and material conditions." This statement shows conclusively that the critic never tried to apply the system in his own work, but simply theorises without comprehending in what manner and to what extent the system could be made useful, because, besides tenement houses, office buildings and factories, which are everywhere erected with little or no regard to beauty, there are numerous monumental structures, such as memorial halls, substructures of statuary, fountains, &c., which are primarily erected for the purpose of commemoration and embellishment. All such structures could be made to conform to the rules of the dynamic system and would be greatly benefited by it. The manner in which minor objects might be improved by the use of the system is sufficiently illustrated by the analyses and diagrams of two Greek mirrors, in the "Diagonal," and any designer of ability need but glance at these diagrams in order to grasp the principle of their construction.

The curious reasoning of the critic is, however, best illustrated by his verdict that "the ancient masons had other things to think of than the application of the dynamic system to their work." There are absolutely no valid premises upon which to base such an assertion, which is also disproven by the masterpieces these masons have left and which continue and must continue to be the objects of our admiration and study. Indeed, these masons must have considered the question of correct proportion and design as the prime necessity of their art, which, unfortunately, does not seem to apply to the modern architect, who considers the practical and business part of his work as more important than the artistic features.

The condemnation of a new theory or system before it is properly tested and tried is an error that is to be deeply regretted and which must always retard progress. The only proper way to prove and disprove a theory or system is to master it first and theorise afterwards. And only the conclusions of those who have done so can carry any weight in the opinion of those who are absolutely unprejudiced.

Gustavus A. Eisen.

New York City

[Another letter on the subject is unavoidably held over until next week.—Ed.]

Exhibitions.

Sir,—With reference to your article "Exhibitions: Their Theory and Purpose," on page 431 of your issue of April 9, may I point out that the Royal Sanitary Institute held its first Health Exhibition at Leamington in 1877? Since then, the Health Exhibition has been held at Croydon, Exeter (2), Dublin, Leicester, York (2), Bolton, Worcester, Brighton (2), Portsmouth, Liverpool, Newcastle-upon-Tyne, Leeds, Birmingham, Southampton, Manchester, Bradford, Glasgow, Bristol, Cardiff, Belfast and Blackpool. A special Smoke Abatement Exhibition was held in London in 1905, and two for School Buildings and Furnishing in London in 1905 and 1907, the latter being held in connection with the Second International Congress on School Hygiene. The Exhibition this year is being held in Bingley Hall, Birmingham, from July 19 to August 5, in connection with the 31st Congress of the Institute.

E. White Wallis, *Secretary*,
The Royal Sanitary Institute.

Economics in Relation to the Present Crisis.

Sir,—Will you permit me space to reply to your correspondent, Mr. R. Midworth, in your issue of April 9? I was exceedingly interested in the last paragraph, and I would suggest that he bring the matter before his union with a view to ascertaining if it is possible to offer any inducement to employers if the workmen are guaranteed (say) 12 months' continuous employment. As matters stand at present it is more usual for workmen to be stood off owing to non-arrival of materials, rain, frost and other matters that occur on many jobs, than for the workmen to be drafted on to other jobs, whereas the man in receipt of a weekly wage, guaranteed for 12 months, would find his way back to the yard with his tools, and from there be drafted to another job. Hundreds of employers are willing to enter into 12 months' contracts with their men, but not so long as it is more to their interest to engage the men on the spot where the work is being done.

It costs money, and oftentimes a lot of money, to ensure continuous employment. If a job is drawing to a close and the nearest job available is ten miles away, the cost at present rates for travelling time and expenses, to say nothing of lodging money and travelling expenses at the week-end to get home and returning to the job, are very heavy. The union leaders have never tried to cope with any problems connected with continuous employment; their one idea has been to press for an increase of the rate per hour until at the present time the increase in that portion of the wages that is for "living" purposes is three times the pre-war standard, and still we are told that nothing can be saved out of it. What the effect will be on the members of the building trade when the spell of unemployment occurs that your correspondent anticipates, it is difficult to forecast. But the question of continuous employment is not beyond solution if properly considered.

Great hopes were entertained when the Labour Exchanges came along that the difficulty was solved, but they have not fulfilled these hopes. Curtailing the hours of work does not help matters, it merely drives the work into the hands of large concerns who are in a position to install machinery to help the work along, and in the decorating trade many thousands of people have done their own work this year; instances are not unknown of workmen becoming master men after the so-called day's work was done, and working late each night and Saturday afternoons.

In my opinion, yearly contracts between employer and employee would go a long way towards a solution of the unemployment troubles referred to, but the employer cannot afford to pay the same rates for continuous employment as for casual employment.

"Builder."

A Village War Memorial.

A war memorial at Iwerne Minster was dedicated on Monday last by the Bishop of Salisbury. The memorial was designed by Mr. Gilbert Scott, and stands on an open triangular site in the village. It is carried out in Doulting stone, and consists of a tall shaft on a wide spreading hexagonal base of steps and a seat. The socket stone has three main faces, and into these are let tablets of Hopton stone marble, on which are cut the names of the fallen. On the lower part of the shaft is carved the figure of a soldier, in a niche, standing with reversed arms. The top of the shaft consists of carved tabernacle work, with three open niches, surmounted by a crocketed pinnacle. The niche on the principal face contains the figure of Our Lord on the Cross; while the other two niches are occupied by figures of St. George and Joan of Arc.

TO IMPROVE LONDON.

We have received the following communication from Mr. Thos. E. Collcutt, F.R.I.B.A.

"Sir,—I am venturing to bring before the public some suggestions for dealing with important problems now being generally discussed. Among these problems the more insistent are: (1) The housing problem; (2) the urgent demand for the building of business premises, offices, &c.; (3) bridges across the river; and (4) the war memorial. I venture to suggest that the solution of these problems can only be obtained by boldly annexing a considerable area of about 150 acres of property, of comparatively small value, south of the Thames, and incorporating it as a concrete part of the City and of Westminster. My proposal involves a bridge at Charing Cross, the St. Paul's Bridge (a definite City undertaking), an embankment, and a bridge and a new street, beginning at St. Clement Danes Church.

"*Housing.*—I understand the L.C.C. have in contemplation the erection, on the outskirts of London, of vast numbers of workmen's dwellings. This may be a desirable thing to do, but, so far as I know, they entirely ignore the multitude of workers who would not only prefer to live in London, but would find it more convenient to do so. Among these may be mentioned the employees of the daily papers, waiters, &c., and a majority of the building trades' workmen. I submit that the area suggested for annexation (a strip of property, say, from the site of the London County Hall now in course of erection as far east as Southwark Bridge, to a depth of 300 or 400 yards) would afford scope for developing the housing problem. I made this suggestion in December, 1918, in the *Builder* and other papers. I then urged the adoption of flats, built in suitable blocks, and with ample space around for gardens and recreation. I have no space to go into detail, but I may mention the desirability of providing bachelor and spinster flats of two or three rooms only. I am convinced that these buildings could be architecturally treated so as to be worthy of so fine a site. Farther south there would be space for housing.

"*Business Accommodation.*—The demand for offices in the City and elsewhere is nearly as acute as the housing problem, and many suggestions for this have been made. The suggested area of about 150 acres (nearly one-fifth of the area of the City), mostly property of relatively small value, available for the erection of offices, public buildings, &c., would form a most essential addition to the City. The distance from St. Paul's to the end of Fenchurch-street is about one mile, and from the same point to Moorgate-street Station the distance is half a mile. On the other hand, this new centre of City activity is only three-eighths of a mile from St. Paul's. There are many large warehouses, factories, and other business premises in Southwark which would be as convenient to the owners if removed to a distance from their present position. Most of these buildings could readily be converted into offices; others could be rebuilt elsewhere, more speedily, and at a less cost, than buildings constructed as offices, &c.

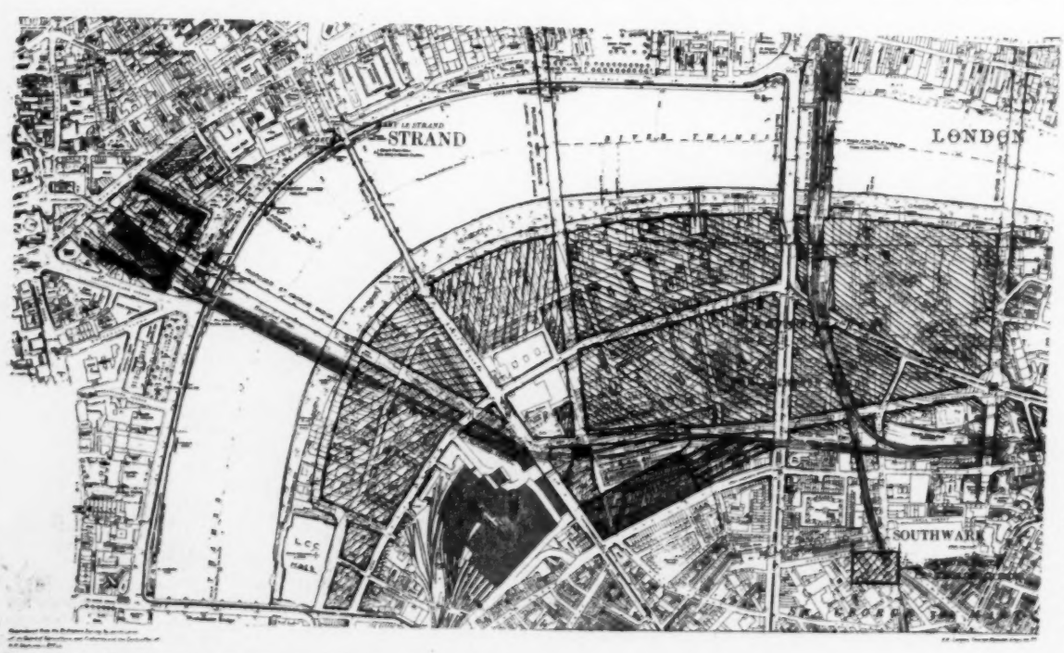
"*Bridges.*—From London Bridge to Chelsea Bridge, a distance of about 3¾ miles, there are eight bridges. In Paris there are sixteen bridges, some of them only 300 yards apart, from the Pont de Jena (leading to the Trocadero) in almost exactly the same distance, viz., 3¾ miles; consequently, Paris is one beautiful city, both sides of the Seine being of equal interest and importance. On the other hand, London is on one side of the Thames only, all to the south being a sordid and mean adjunct, having only one building (St. Saviour's) of historical and architectural interest. In the scheme before your readers are three proposed bridges, viz., Charing Cross, St. Clement's, and St. Paul's, and, connecting these bridges on the south side, an embankment. The erection of these bridges would go far towards making the south side an integral part of London.

"But here I venture to revert to my opening address as president of the Royal Institute of British Architects, in 1906. I then formulated a proposed Charing Cross Bridge, partly covered, and with or without shops on either side; this would really form a continuous street, such as that on Old London Bridge, where visitors on their way to Shakespeare's Theatre had not to encounter the discomfort of an open bridge. I see no reason why a covered bridge cannot be treated in a monumental manner, and I think Sir Aston Webb would bear me out. When the widening of London Bridge was in hand, there were temporary covered footways, and Sir Aston, in one of the many and always instructive speeches he has had to make, regretted that this temporary work had not been made a permanent one.

"*War Memorial.*—It is rumoured that the Government, acting on a report from a Cabinet Committee, propose to make a huge clearance between Lambeth Bridge and the Tate Gallery, and to construct an Empire Avenue, a bridge, picture galleries, &c., thus forming a war memorial. But why should the memorial be placed on what may well be called an outskirt? In visiting the Tate Gallery, one looks upon it as almost an excursion. Who will undertake to describe this *terra incognita* without first looking up the map of London? But public opinion generally seems to be in favour of Charing Cross, and this site (of greater extent than Trafalgar-square) would certainly give the opportunity of erecting a most stately memorial. It would give ample space for some of the buildings contemplated by the Cabinet Committee, with open loggias which would form a 'campo santo' for the memorials of those we desire to honour. Picture galleries would be above the loggias. An 'arch of honour' would form the central and dominant feature, this leading to the memorial bridge—on the south side of which could be a further architectural feature.

"The practical man will, very naturally and rightly, inquire where is the money to be found to carry out these dreams of a more beautiful London. I reply that the Bridge House Committee would be responsible for St. Paul's Bridge, the London County Council for the St. Clement's Bridge, and the Government for the War Memorial and Charing Cross Bridge.

"*Southern Embankment.*—There remains the reclaimed land of 150 acres on the south side. There is, no doubt, an urgent need for enlarging the business accommodation of the City, and this southern area seems to be the solution of the difficulty, and with extra bridge communication it would certainly form an important addition to the City. Of course, the whole of the 150 acres suggested as available need not be 'taken up' at once. The embankment and road once formed, the property to the south could be obtained by degrees. This proposed enlargement of London may be considered of such public utility that it may be possible to obtain an Act of Parliament (similar to the Railway Acts) giving a properly constituted body the right to purchase by valuation. I have carefully gone into the question, and, on mature consideration, believe that the scheme could be made a paying one. In this I think any professional valuer of property would concur with me. I should like to add that these proposals should be considered as a first step only. For instance, it would be a great improvement to remove Cannon-street Station to the south side, and retain the bridge for ordinary traffic. This would form a dislocation of the present system, but that system could be greatly improved by the electrification of the suburban lines. The Brighton line is practically suburban, and could be so treated. It would have the great advantage of its being possible to link up with the present 'Tube' system, and so land passengers in more than one station in the City. A still further improvement would be the removal of the railway stations, and the bridge which crosses the river, at Blackfriars—surely the greatest eyesore on the river."



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An ordinary general meeting of the Royal Institute of British Architects was held at 9, Conduit-street, W., on Monday last, the President (Mr. J. W. Simpson) in the chair.

The Hon. Secretary (Mr. A. Keen) announced the decease of Mr. James Ledingham, elected an Associate in 1885 and a Fellow in 1892.

Mr. Thomas Hardy.

The Hon. Secretary announced that the Council had recommended that the hon. Fellowship of the Institute, on the grounds of his eminence as a man of letters and his former association with the Institute, be extended to Mr. Thomas Hardy, O.M. Mr. Hardy's association with the Institute began fifty-eight years ago, when he was awarded the Institute medal for his essay on "The application of Coloured Bricks and Terracotta to Modern Architecture."

Welcome to Mr. Cram.

The President offered a welcome to Mr. R. A. Cram, of the American Institute of Architects, and remarked that whilst there were little squabbles going on amongst nations there was no friction in art. Art was the one sympathetic, permanent point of contact between all nations.

Architecture in India.

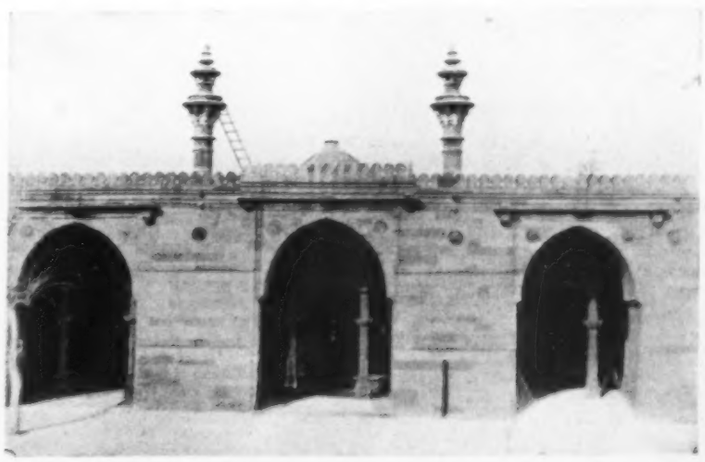
In the course of a paper on "Architecture in India," Mr. John Begg, Consulting Architect to the Government of India, said that his object was first to try to set before them a picture of the situation to-day of architectural practice in India, and, second, to attempt to find in the more prominent points of that picture a peg or two on which to hang a few reflections as to tendencies which might, or might not, develop in the future. The architect in India was handicapped at the outset by a universal ignorance of his functions, and by apathy as to his aims, such as architects at home had no conception of. He had no track cut for him, no rails laid for him. He had to lay his own rails as he went along, hewing his way through a jungle of prejudice, misconception, scant appreciation, and even jealousy. He was beset by temptations to "play to the gallery" to take the fatal line of least resistance, to turn to this side or that, rather than follow the direct lead of the "Mistress Art."

And yet there was no country in the world where building operations were more in evidence than India. Nowhere were the erection of new buildings and the alteration and adaptation of existing ones more light-heartedly undertaken. Nowhere were those forces of change and development that found an outward expression in building operations more active. Nowhere were materials more plentiful, and also labour—of a sort. No country in the world had a more imposing architectural heritage from past ages. Nowhere, in short, were there at the present day so many circumstances pointing to opportunities for the architect of energy and capacity. Yet, in all that vast continent, inhabited by over 300 millions, the number of really qualified architects was under twenty in Government service, and a somewhat smaller number in private practice. Speaking for the Government architects, they had all been extremely busy, and the mere aggregate cost of their executed works, if paid for at ordinary professional rates, would certainly have cost the public exchequer in fees a great deal more—to put it with studied mildness—than it had actually cost in salaries and office expenses. If the mass of their unexecuted designs were added, a total would be reached that would be somewhat staggering. Similarly, it could be shown that their employment, in place of the old departmental process, had led to actual savings to Government such as would alone justify it. Its architects had been cheap to Government. Had they, at the same time, been successful in avoiding the attribute proverbially associated with cheapness? They, naturally, believed their work had been good, and were personally interested in having it so acknowledged. His hearers, on the other hand, as representing the private profession, and being, therefore, presumably conscientious objectors on principle to the official architect, were suspect of prejudice in a contrary direction. He deprecated the application to India of the principle that objected to official architects. Public mentality was of so peculiar a structure in India that the profession would never begin to make headway there in private practice till Government not only introduced it in the person of the official architect—it had already done so—but taught the Indian public how and what to think of it by an even more extended and flattering demonstration of its own appreciation than it might have been understood to entertain hitherto. There was good reason for the principle in England, where it was sound in the best interests of architects, of the public, and of the work that concerned both. Not so in India—not yet, anyhow, by a long way. As had been the case with all other professions which had "caught on" in India, the way in that country would never be clear and free for the adequate private profession, which he would like to see established, till the position of the Government architects had become stronger, and so yielded many more official pioneers to clear it.

He did not claim that architects in India had done more than pioneer work. They had been feeling their way in the dim light of dawn, as it were. Each of them had been toiling away independently in his own province and sphere. They had had little opportunity to meet and compare notes. Wisely or otherwisely, it had been decided that co-ordination of effort was not an expedient to be attempted. Therefore, their work had been of the nature of a number of sporadic experiments, the keynote in each case being derived from the individual's reading of specific conditions (and it was remarkable how these could vary in a big area like India) such as those of climate, materials, labour, surroundings and the purposes of the particular building. For instance, the two large towns, Calcutta and Bombay, sounded totally different notes to the architect. Bombay was energetic, exuberant, sparkling, breezy, and had building stone of many kinds and colours. Calcutta was calm, respectable, orthodox, and its leading materials were brick and plaster. A massive (apparently) type of Classic renaissance, by no means to be sneered at, early asserted itself there, and had retained its hold unshaken by comparatively recent outbreaks of a travesty of it. A similar expression, in spite of early bricks and plaster examples by the Portuguese, never took kindly to the atmosphere of Bombay, which remained to a greater extent style-free, with, however, a somewhat licentious leaning to experiments in the Gothic manner after it had realised its wealth in building stones.

There was one very important result of the employment of architects which could hardly be gauged by the most copious exhibition of building-photographs, but which he regarded as not the least of their achievements in a country that was the slowest to move, and the most difficult in the world to impress. He claimed it to be due to the architects that there had of late years been a very marked progress in building craft in certain specific directions. First, there had been an improvement in the making and handling of bricks. They were formerly dismayed to find how little regard there was to those qualities in a brick which the architect looked to. Hardly anyone knew the exact size of a brick, or what gauge it would build to. Time after time he had had to recast the half-inch details of buildings because of misleading information and the discovery that the bricks could not after all be worked to the gauge agreed upon. That had become a thing of the past, and in most places of importance they could now rely on the data given them. Also, something had been done to standardise sizes. Again, the practice in handling bricks was hopeless. In Calcutta, for example, the bricks, none too shapely, were made some miles up the river. They were carted down to the waterside and there dumped in heaps. Thence they were flung anyhow into barges and brought down to Calcutta, flung on shore, again flung into carts and finally dumped at the building side. Needless to say, after all this, they had no arrises left—but that was not thought to matter. All the more key for plaster, or, if a brick-faced effect were desired, the wall-surface was patched with mortar, then evenly coloured, and the whole beautifully tuck-pointed with neat white lines! Naturally, the architects would have none of this, and the result, after much pegging away, had been seen in very marked improvements all round. He had in later years seen in India the best brickwork done that had come to his notice anywhere.

Similarly with stonework. There were no finer quarries or better raw material in the world than in India. But they indulged in the most slipshod methods of work. Jointing hope-



A Minar on the Masjid at Dholka: Detail of Front.

Measured and Drawn by Mr. P. R. Ugwadia.

lessly wrong, work built half-finished and dressed afterwards, &c. He believed they had taught the Indian building trade a wrinkle or two in masonry. There used to be a most heart-breaking trick in use on the Bombay side. In finishing cut-stonework they would paint it all over with a wash of lime mixed with dust of the stone itself, obliterating not only dirt and mortar-stains but joints, tool-marks and other little "blemishes" as well! The effect, till a monsoon or two had played on it, was that of rather roughly-done plaster-work. Some of this art was still in progress, but not so much as formerly. It was the same with carpentry, joinery, wrought-iron, painter and glazier work, paper-hanging, &c., even down to the making of furniture and carpets. Moreover, they had done something to bring about the substitution of the plaster ceiling for the canvas and match-boarded ones of old time.

The Indian workman was exceedingly intelligent and resourceful, also tractable and amenable to sympathetic treatment. His faults lay chiefly in his training, or the want of it. He was apt to be slipshod, careless and inaccurate. But if architects showed him that they were interested in his work, that they would not pass bad work and were ready to appreciate good; let him see that they could respect his personality, and at the same time that they could teach him something, and he soon brought to bear his own interest and his readiness to learn. He soon acquired the habit of sharpening his tools, of regarding the sixteenths of an inch, of taking pains and pride in his work. Like all mankind, he shied at methods new to him; but keep at him, and his intelligence, tractability and approbativeness would soon bring him along to their side. When in Bombay, he once worked out a method of constructing domes and domed vaults in brickwork, the merit of which was that no centering of any kind was required, to the great advantage of the work in economy as well as strength. The Bombay brick-masons had never dreamed of such a thing, and there was for a time likely to be a strike on a small scale. But he (the speaker) stood firm, and found four bricklayers who consented to try. A small hemispherical dome, of about 20 ft. diameter, was successfully completed, and subsequently others on a larger scale. He had had similar domes built by his method all over India up to a diameter of 50 ft. without difficulty or mishap, and could now undertake to build one anywhere up to 60 ft., or even more. Indeed, there appeared no limit within reason to which the method was not applicable. Prejudice had been quite overcome and the method might be said to be the accepted one in the P.W.D. for the construction of such work, which was of considerable applicability to the uses of India.

By far the most enticing consideration connected with the architect's position in India was the consideration of what ought to be his architectural policy, what ought to be his guiding principle in finding the key-note of his architectural expression, by which the suitability of the latter for the soil of India was to be judged. About the time of the initiation of the great Delhi project that question assumed some of the dimensions of a controversy. He wished to take that opportunity to put the question in its purely general application, with a view to seeing if it were possible to arrive at a general principle or principles that might be of assistance to the rank and file, who were not yet distinguished architects, but who were already practising in India, and who were likely to do so in increasing numbers in the future. He felt strongly that they were in some need of such a lead—that its absence kept the sum of their scattered activities from becoming a genuine "movement." He felt that the time had come when they ought to agree on a definite architectural policy.

He admitted that the point was a controversial one—but that made it only the more interesting. There would appear to be two schools of thought on the matter. One school held that they should do in India as the Romans did in every country whereon they planted their conquering foot. The British, they said, should take their architecture with them, along with the law, order, justice and Western culture, and that architecture should embody an expression of those things. That school deprecated all revivalist experiments. Let the work of the past stand as the memorial of the past, they said; let the work of the present stand future ages as the memorial of their rule under the British Raj. The only other school which had so far found a voice pointed to the acknowledged fact that an uninterrupted living tradition in architecture existed to-day, linking the present direct with the past in India alone, perhaps, among all countries of the world. It contended that the true policy ought to be to shun all imported forms and ideas and imported architects alike, but to foster and feed the existing living tradition by the agency of the men with whom that tradition resided. It emphasised the need for action calculated to maintain the tradition in view of the fact that the latter was actually dying out for want of sustenance.

There was much to be said for both points of view, divergent though they might appear to be. He found himself in some agreement with each, and yet in about equal disagreement with each. Neither quite covered the ground. The position to which he, after close on twenty years' study of the problem on the spot (and it was not one which could be mastered except by actually living with it and watching it in relation to all the ordinary daily architectural needs, as it were, of the country)—the position to which he found himself to have leanings was one exactly intermediate between the two. Stated briefly, it was this. Let the architect take to India all his real principles, all his technical skill, both in design and in execution, all the essence of his training, *but nothing more*. There let him set himself to a new pupilage, and study India's indigenous forms and expressions in relation to the general conditions he found there. Let him absorb these forms and expressions into his consciousness, until, without abandoning one essential of his earlier training, he could, as it were, not only speak, but also think architecturally in an indigenous manner. Then, and not till then, let him tackle the problems of design for specific conditions, and he would find he could arrive at a solution at once indigenous and architecturally sound, modern and vital.

The first school was founded on somewhat of a misapprehension. It was arguable that we never conquered India at all in the Roman sense. Surely ours was more a commercial than a military conquest, and perhaps more a cultural conquest than either. And even if the original conquest had been a military one, surely now, in 1920, there was seen to be no room in the world for a military empire, such as the kind of architecture advocated would typify, even in the Orient. Our object was not merely to hold India, not even merely to govern it. Was it not rather to assist India to learn how to govern herself? Would not any monument, however great as a work of art, that asserted the idea of the conquering heel of a superior race, and that therefore branded the people as of a subject race—would not that go far to defeat our object? And how could one expect a mode of architectural expression evolved under different skies (itself the outcome of repeated revivals) and in totally different conditions to settle down comfortably in any country, especially one with a tradition of its own? Surely the foundation, the texture, the ultimate quality, the accent, of all architectural expression lay in the craftsmanship. Could we train the Indian crafts anew, and teach them to assimilate our accents? Had any craft in the past ever really been so trained? Did every craft not rather train itself? Look at the Græco-Bactrian sculpture. For a century after Alexander's invasion of Northern India the Greeks tried to train the Indian craftsmen to catch the Greek accent, and what did we get? At its best a watery imitation of Greek—hybrid, Eurasian.

So they came to the second, the craftsman, or "swadeshi" school, and he asked whether it was a working proposition that modern India should "find herself" architecturally without the assistance of architects. The indigenous craftsmen were a simple people, all unversed in the ways of modern life; they had the most rudimentary business ideas. Time could not be of the essence of any contract with them, nor could more than an approximation—if that—in matters of cost. The thing was unworkable in this business age. He feared that the experiment which this school advocated would be more likely finally to kill out the livingness of the indigenous tradition, tenuous as that had become through comparative neglect, than to give it a new lease of life. We could not do without the architect, and till India was in a position to produce indigenous architects they could not do without the imported British architect. But every lover of India, and of architecture, would wish to speed the day when that country should produce her own architects and should have a strong, healthy, indigenous profession of her own. It was for that indigenous profession of the future that it behoved them to prepare the way, and to set the tune. He would have every architectural effort tested by the question: "How will this fit in with the scheme of the future? Does it contribute anything to the carrying on of India's architectural tradition, or does it not?"

There was the question of how far it was possible for a modern British architect to find materials from the still living tradition in which he could express himself fully and freely, without detriment to the modernness of his work. He thought he could if his mind was sufficiently open and unprejudiced, and if he knew how to look for his material. He did not think that one could study the work of Ahmedabad, Champanir, and Bijapur without finding suggestions for the treatment of most parts of a modern Indian building for any purpose whatever. He did not think an architect could study those works at all exhaustively, or for

A Minar on the Masjid at Dholka.

any considerable period, without feeling himself in tune with their builders, and inspired to create as they were and as they did. And if the tradition was living, as had been admitted, was not that circumstance a guarantee of its possibilities on its own soil?

He felt that there existed in India an opportunity—or at any rate that some of the ingredients of an opportunity existed for the architect—such as was to be found nowhere else in the world. This unique thing, the survival of a living tradition of craftsmanship, and the other peculiar conditions to which he had alluded, were among those ingredients. The opportunity was one for the architect to produce living modern architecture. However inspired the design, had they not time and again despaired of finding the craftsmen (under the Western system) in full sympathy? How often had not one seen a fine conception that "doesn't just come off" for want of the true craftsmen's note? And this where the ideas of the design were not foreign to the country of the workpeople. But in India, provided they themselves had absorbed the indigenous tradition, and had designed in the spirit of it, there were the craftsmen ready and waiting, able to grasp their intentions at a glance, and to render their details, not merely intelligently but with something of the same inspiration that bore upon them in conceiving the work. A building so conceived, and so carried out, might achieve what should be the ideal for great architecture, an embodiment of the working of a great corporate mind, of which mind that of the architect was but the co-ordinating part. In such a building might be recaptured the spirit of the guilds of old.

A living tradition of craftsmanship and design still existed in India in a somewhat feeble state of vitality; and the aim should be to keep that alive, to foster it and give it a new lease of life. In it were the germs of India's future architecture, an indigenous architecture by indigenous architects. The *métier* of the British architect now should be to act foster-mother to the infant growth. To this end the clearest thinking was necessary at the present time; and the Institute and its members, by their sympathetic interest, could give powerful aid in building up a body of professional opinion on right and helpful lines.

Discussion.

The President said Mr. Begg has asked whether they could give him some definite ruling as to the lines which the architect in India and he supposed in any other country outside his own, should take. Ought he to insist on a rôle as conqueror and fix his style on the people, or should he take his technical knowledge of science and adapt it to the style of the country in which he worked? Mr. Begg had answered his own question. That evening he had had the very happy idea of classifying the slides he had shown in chronological order, and from them they saw the evolution of the architect, and a very satisfactory evolution it had been. They saw him starting with his European ideas, which were excellent in themselves, but did not seem to fit the surroundings very well, and they saw him develop until he came into the clear study of black and white, and then they saw free, simple composition which they all applauded.

Mr. R. A. Cram said he was absolutely in accord with the final conclusions reached by the author in the matter of the duty of the architect in India towards Indian architectural problems. Style was so much a greater thing than the styles they noted historically. It was true they had to go back to these constantly, but they went through them finding what the real qualities were, and so, little by little, eliminating the more or less accidental qualities of styles themselves and getting down to the fundamentals of style. In the work which Mr. Begg had shown at the end they had real style which all of them as architects were striving for, although only too often they contented themselves with achieving what was more or less actual repetition of some past historical style. That was a thing which was a greater danger to them in America than in this country, because they had so little in the line of architectural continuity they were bound to build up something new for themselves, and naturally they went back to one style or another as their tastes might lead them, and so far as they succeeded in reproducing that style accurately and creditably they felt that they had succeeded. Perhaps he should have said that this was so in the past, because in the last fifteen or twenty years there had been an increasing realisation in America of the fact that they must get away from the copying of English Georgian, French Gothic and French and Italian Renaissance, and achieve for themselves some consciousness of the real conditions of fundamental style that had expressed itself in the different architectural styles with which they were familiar. He was not sure that was the problem which confronted them in this day and generation, when they found the necessity for rebuilding civilisation on the ruins of a civilisation which for good or for ill was upset. They were bound to go back and learn from the cultural and civic styles of society in the past all that they could which would be of assistance to them in the rebuilding of the new culture of civilisation; but if they contented themselves with these narrow and limited archæological forms they would produce nothing in which there was any real vitality. From their study of these elements in past history, which had produced great civilisations, they might perfectly well achieve what he would call a style of real civilisation, and having done that they could go forward content with the future which would open up before them.

Mr. James Ransome proposed a vote of thanks to the author. With regard to the question asked by Mr. Begg, his (the speaker's) answer was "utility." Some time after he had been in India and studied the buildings there, he expressed the opinion that the future development of architecture in India lay along Anglo-Indian lines; and he was instructed not to put up any mongrel buildings in the country. In the new Delhi the architects had availed themselves of the freedom from tradition which Indian conditions admitted. There was little evidence that the Mohammedan invaders of India thought their architecture should stand as an example of their rule; but it was certain by the use of their own methods of construction and their intelligent employment of such practices as they found in the country, they aimed at a result which neither they nor the people they conquered could have achieved alone. By following their example, and while giving of their best, availing themselves of any suggestions India had to offer, perhaps some day they would achieve something which would bear comparison with the Taj Mahal.

Sir Lionel Jacob, in seconding the motion, said he was not an architect but an engineer, and none could conceive the friction which at one time existed in India between engineers and architects. Architects in India had had to contend with the ignorance of officers, and the animosity of engineers. Mr. Begg seemed to hint that they were teaching the Indians to govern, and that time might be when they would clear out of the country, and therefore architects should design for the Indians to come. He did not agree with that and hoped that India would never be abandoned by the British.

Mr. H. H. Statham said the author had touched on an interesting subject, and to the position they were to take as a foreign race in India. The author said they were not as the Romans. Well, they were, and they were not. It was a wonderful history, which commenced with a great deal of commercial trickery and extended into government. They were in the position of conquerers: fifty and sixty years ago certainly they acted as such. The idea that they were working to enable India to govern itself was rather a recent one, and was one which perhaps they ought to support; but he believed it would be a long time before England could safely retire from India. He believed the control of England in India would be one of the greatest pages of history, and was a thing of which the country could well be proud. He thought to some extent they should act as the Romans. Wherever the Romans went they built their theatres and triumphal arches, just as they would in their own country. They ought not to go so far as that, but he thought the buildings erected for Government purposes should to some extent bear the stamp of having been built by the English nation for English Government. At present they had settled down rather on Classic lines, and Classical lines would suit the climate of India much better than their own climate. He thought the official buildings in India should bear some stamp of Classicism, but modified in the first place by conditions of atmosphere, and in the second place by the details of the country. They were in the middle of new flora and new forms of vegetation, and it struck him they could do something founded on Classic architecture, and bearing the stamp of that, but with a great deal of new detail. He saw the prospect of a new Classical style. He thought the buildings they had seen on the screen were too Anglo-Indian, and would have them more Anglo and less Indian. He felt there might be before them in that respect something very beautiful and novel in architectural style.

The vote of thanks was passed and briefly acknowledged by the author.

The Secretary announced that the next meeting would be the annual meeting on May 3.

EXHIBITIONS OF THE WEEK.

The Architectural Association.

Our readers will be repaid by a visit to the exhibition of students' drawings at the A.A. in Bedford-square. In one room are some examples of French and American work, and in the upper gallery are a number of studies of first, second and third year work at the A.A Schools. The drawings from the Massachusetts School are good, some of the figure drawing being excellent.

In the French section the design for a commemoratal column is very clever. The column is built in open lattice work with spiral bands carrying inscriptions. Notwithstanding the elaboration of detail the general form and treatment are restrained and dignified. This obtained a first prize medal. A charming general elevation of doors to a palace of justice was awarded a second prize medal. A clever pencil elevation of a wall clock is also noticeable. There is also a spaciously designed interior of a salon in colour (with many figures) which is very broad and vigorous.

It is a pleasure to see such excellent drawing by the English students, and so good an average of design. There are over a hundred exhibited and conception of colour value is strikingly shown in many drawings, no less in the greys and yellows of a city church after Wren than in the Roman doorway (M 12) or the monumental staircases by G. H. D. Hughes, or others which it is difficult to give an identifying mark to. At all events, one gratifying feature about the work generally is that breadth and vigour are well to the fore, and students have evidently had no ambition to study petty or trifling details. If we venture a criticism it is that we should have liked to see a little more dealings with modern life and affairs in the designs and an attempt to grapple with the difficulties of our traditional English work which seems rather under a cloud at present to make way for Roman columns. At all events, we may feel sure that the important qualities of architectural design are being enforced with good educational results even if the instincts which have led to the evolution of more purely national design have to emerge eventually through the filtration of the Classic training.

New Welsh Mining Village.

The Housing and Town-Planning Association proposes to erect 2,000 houses at Llay, a new mining village near Wrexham. The Association has already secured land for 1,000 houses and intends to erect 200 dwellings by the autumn. When the whole scheme is finished there will be a new population of about 10,000 at Llay.

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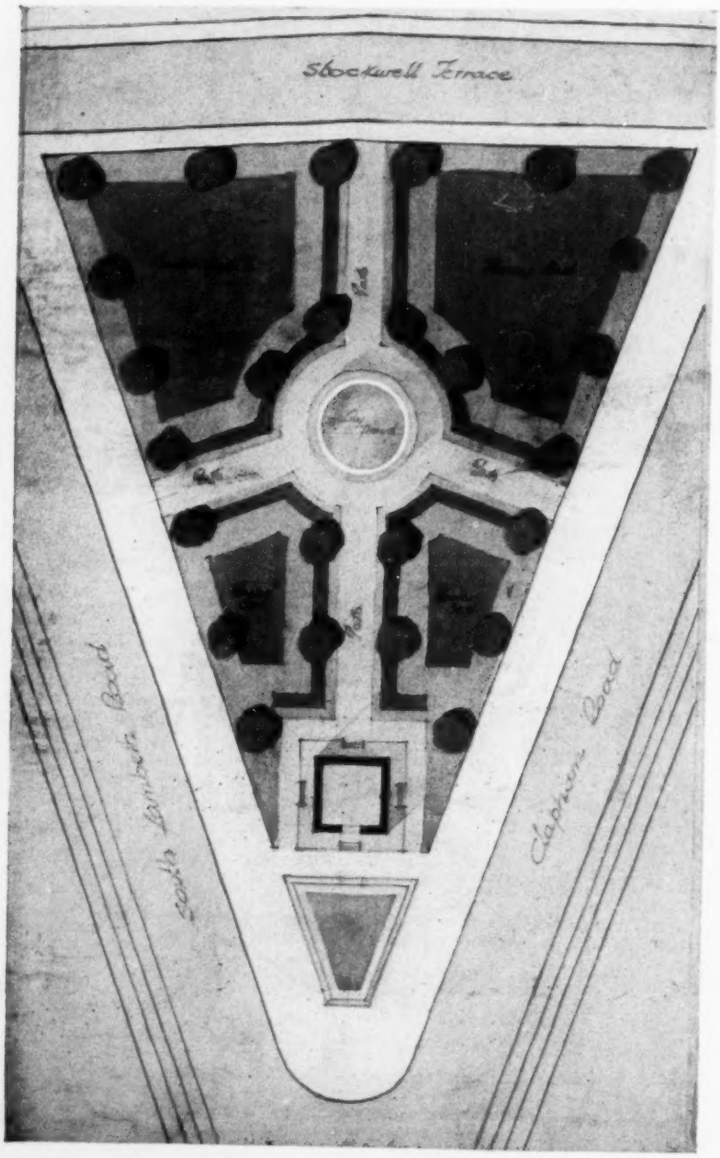
ILLUSTRATIONS.

Mosque at Cairo.

The Mosque at Cairo is a typical building of its kind. The cross beams at the bottom of the arches are usual, and in a water-colour drawing help the perspective effect. The voussoirs are painted on the top of a rough coat of plaster. The pulpit and fittings are those which are usually found in the Cairo mosques. Our illustrations are from drawings by Mr. John Keppie, F.R.I.B.A.



Stockwell War Memorial: Ground Plan.
First Premiated Design, by Mr. Frank T. Dear, A.R.I.B.A.

Stockwell War Memorial.

A review of the designs submitted in the Stockwell War Memorial Clock Tower Competition was published in our issue for March 26. This week we illustrate the first premiated design, by Mr. Frank T. Dear, A.R.I.B.A.

Design for a Clock Tower.

This design for a clock tower on the R.I.B.A. conditions for the War Final Examination was worked out under the supervision of Mr. T. P. Bennett, A.R.I.B.A., Head of the Northern Polytechnic Institute School of Architecture, Building and Surveying. The design has been simply treated upon Italian models, the problem having been used as a means of studying Italian Renaissance work and its practical application to modern work. This is the first design made by Mr. Feltham after his return from the Army. The materials would be warm-coloured bricks with Portland stone dressings, iron railings at the top and bronze lions.

Design for a Cottage.

The design for a south country cottage is by Mr. Ernest G. Allen, F.R.I.B.A.

Kingsbury Garden Village.

We illustrate the lay-out of an estate, comprising about 40 acres of land, which is to be known as the Kingsbury Garden Village, situated close to Neasden Station on the Metropolitan Railway, about five miles from Baker-street. Natural features did not depend upon contours, as the land is practically flat, but a few lines of well-grown trees have been adopted as road lines, with the result of a pleasing and symmetrical lay-out. The roads have natural curving lines, and there are edges to paths, wayside greens, quadrangles and closes. With the accommodation of two sitting-rooms and three bedrooms, houses are now being built for the Metropolitan Railway Country Estates, Ltd.

The village has been laid out by Mr. E. J. W. Hider, architect, from whose designs the houses are being erected. The "wheel turn" shows a novel method of treating the right-angle turn of the road, shown in the left-hand bottom corner in the reproduction of the model. Our illustration of the lay-out is reproduced from a photograph of a model prepared by Mr. John B. Thorp, which, we understand, has proved of great assistance both to the Company and the architect.

MEETINGS.

Friday, *April* 16.

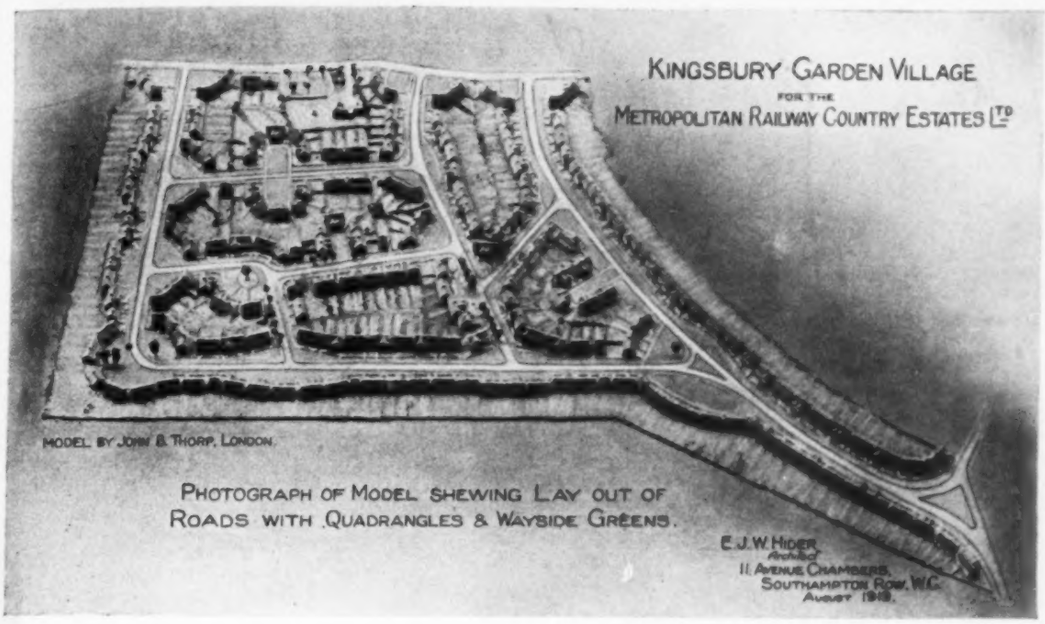
Institution of Municipal and County Engineers.—Mr. H. Richardson on "Post Bellum Road Restoration." At Olympia. 5.30 p.m.

Saturday, *April* 17.

Edinburgh Architectural Association.—Visit to Caroline Park and Granton Castle.

Monday, *April* 19.

Surveyors' Institution.—Mr. C. Browning Fisher on "Some Problems connected with


KINGSBURY GARDEN VILLAGE
FOR THE
METROPOLITAN RAILWAY COUNTRY ESTATES LTD
MODEL BY JOHN B. THORP, LONDON.
PHOTOGRAPH OF MODEL SHEWING LAY OUT OF ROADS WITH QUADRANGLES & WAYSIDE GREENS.
E. J. W. HIDER
Architect
11, AVENUE CHAMBERS,
SOUTHAMPTON ROW, W.C.
August 1919.

Agricultural Policy." At 12, Great George-street, S.W. 8 p.m.

TUESDAY, *April* 20.

Illuminating Engineering Society.—Mr J. Darch, on "The Lighting of Churches." At Royal Society of Arts, John-street, W.C. 8 p.m.

Institution of Civil Engineers.—Sir Dugald Clerk on "Coal Conservation in the United Kingdom." At Great George-street, S.W. 1. 5.30 p.m.

THURSDAY, *April* 22.

Concrete Institute.—Mr. Harry Lloyd, on "The Consistency of Portland Cement, Mortar and Concrete." At Denison House, Vauxhall Bridge-road, S.W. 7.30 p.m.

Meetings at the Building Trades Exhibition.

The following meetings have been arranged by the Society of Architects to take place at Olympia during the Building Trades' Exhibition:—

Friday, April 16.—Public meeting in the small Conference Hall, at 5.30 p.m., to discuss a subject introduced by the Electrical Development Association.

Monday, April 19.—Public meeting in the small Conference Hall, at 5.30 p.m., to discuss a subject introduced by the Federation of Building Trade Operatives.

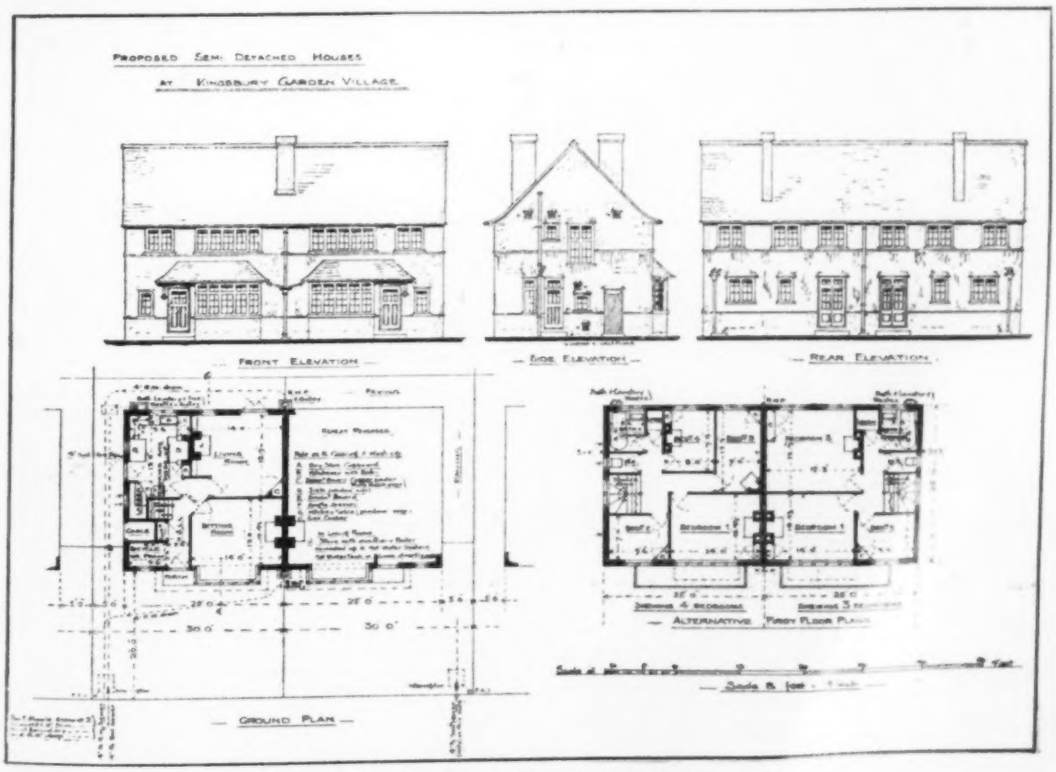
Tuesday, April 20.—Public meeting in the small Conference Hall, at 5.30 p.m., when representatives of the National Federation of Building Trades' Employers will explain the National Building Code.

Wednesday, April 21.—Public meeting in the small Conference Hall, at 5.30 p.m., when representatives of the Architects' and Surveyors' Assistants' Professional Union will explain the scope and objects of their organisation.

Thursday, April 22.—Public luncheon at the Pillar Hall, at 12.30 p.m., when representatives of Government departments, kindred institutions, public bodies and the building industry will be the guests of the Society.

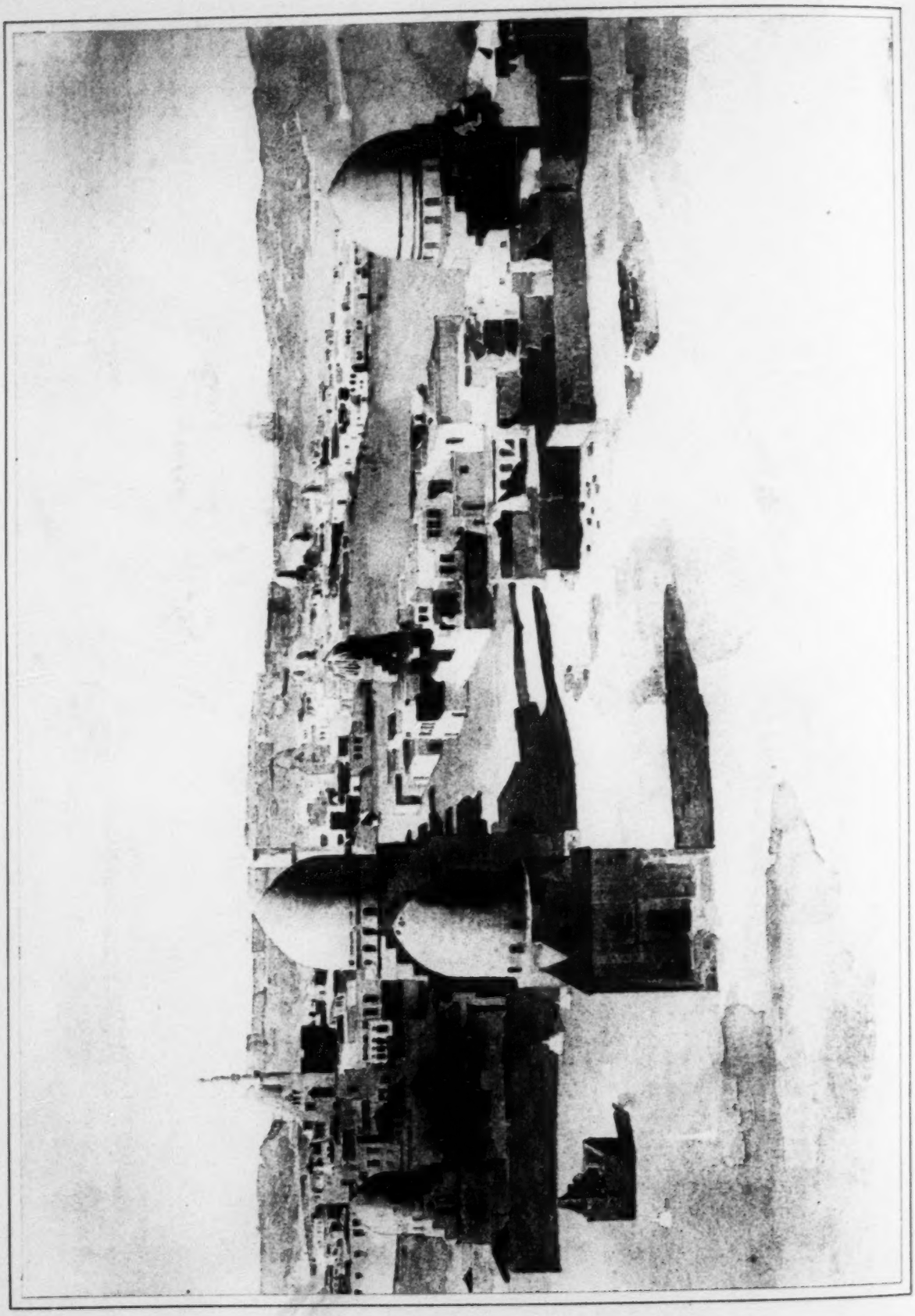
Friday, April 23.—Public meeting in the small Conference Hall, at 5.30 p.m., when representatives of the British Commercial Gas Association will open a discussion on "Gas Heating in Relation to Economy in Building."

The Princes Rooms at Olympia have been fitted up and furnished for the use of the Society as Headquarters during the whole period of the Exhibition.



Kingsbury Garden Village. MR. E. J. W. HIDER, Architect.

[A noteworthy feature of this fine fountain by Carpeaux, in the Luxembourg Gardens, Paris, is the magnificent vigour and spirit with which the sea horses are modelled.]



CHEYKHON, CAIRO. FROM A DRAWING BY MR. JOHN KEPPIE, F.R.I.B.A.

THE WHEEL-TURN. A CORNER IN KINGSBURY GARDEN VILLAGE.

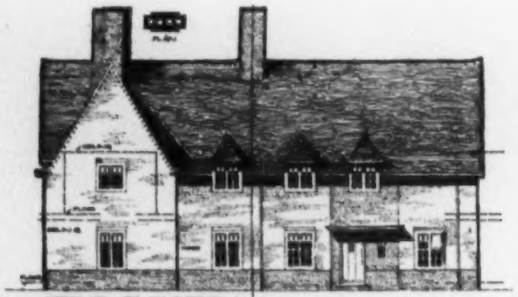
E. J. W. HIDER, ARCHITECT.
11 AVENUE CHAMBERS
SOUTHAMPTON ROW. W.C.

STOCKWELL WAR MEMORIAL COMPETITION: FIRST PREMIATED DESIGN.

BY MR. FRANK T. DEAR, A.R.I.B.A.

DESIGN FOR A CLOCK TOWER

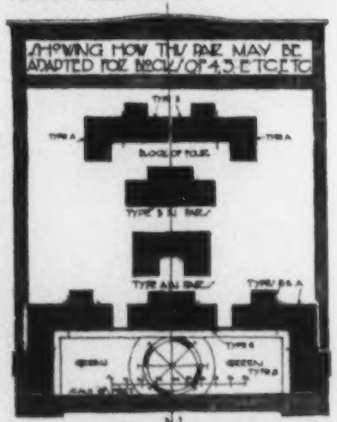
By Mr. Stanley Feltham (Student, Northern Polytechnic).



FRONT ELEVATION

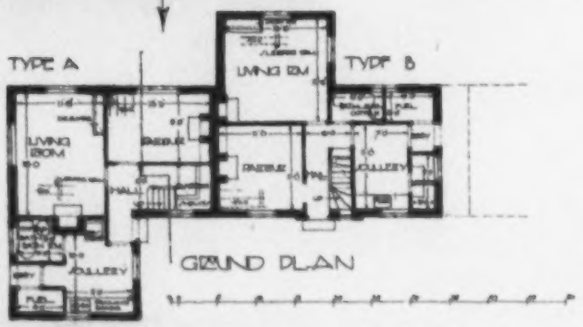
FLANK ELEVATION

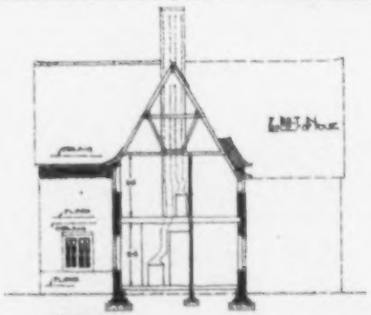
REAR ELEVATION

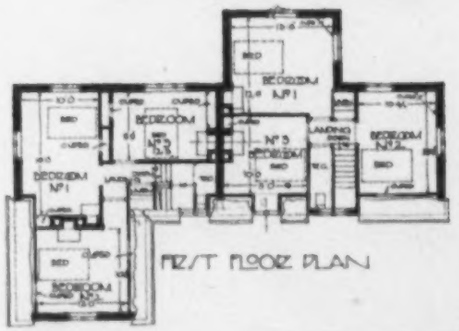


NOTES ON CUBICAL CONTENTS/AREAS/				
ROOM	TYPE A	TYPE B	A	B
LIVING ROOM	184	184	1472	1472
PARLOUR	116	117	928	936
SCULLERY	90	77	720	616
BATH ROOM	30	25	240	200
LARDER	24	21	168	168
FUEL	18	22	144	176
BEDROOM No 1	156	168	1240	1335
D° 2	125	134	1000	1068
D° 3	111	110	880	880

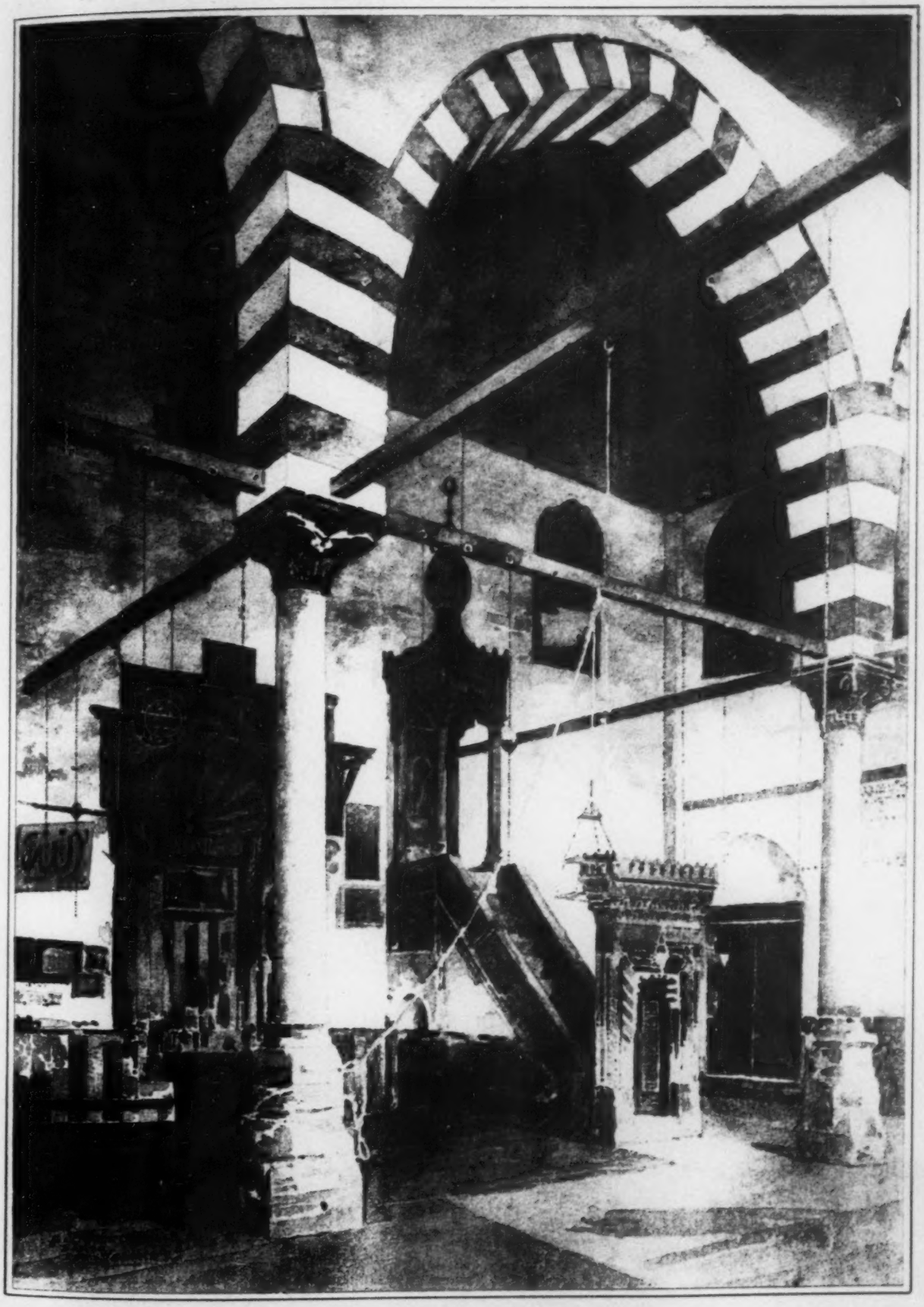
TOTAL CUBICAL CONTENTS OF EACH HOUSE
TYPE A 14,520 CUBIC FEET TYPE B 15,773
No 1 725 L 789







DESIGN FOR A SOUTH COUNTRY COTTAGE, BY MR. ERNEST G. ALLEN, F.R.I.B.A.



MOSQUE, CHEYKHON, CAIRO. From a Drawing by Mr. John Keppie, F.R.I.B.A.

DYNAMIC SYMMETRY.

We have received the following letter from Mr. Jay Hambidge in reply to Professor Lethaby's article in our issue for February 6 last, and our comments on the system. *(See our leading article this week.)*

"If *The Builder* will grant permission, I should like to reply to some of the points raised by Mr. W. R. Lethaby in his article of February 6 on 'Building Measures and "Dynamic Symmetry"' as well as those made by *The Builder* itself in a later notice of my work on design analysis. It was a matter of much regret to me that I did not have time to answer these criticisms before leaving England. However, as the questions at issue depend largely upon a basis of fact and not opinion, I am taking it for granted that it is not too late.

"Mr. Lethaby uses the phrase, 'The Law of Divine Liberty.' It is a good phrase, and in a sense admirably expresses the type of freedom which we voluntarily grant the artistic genius. Without qualification or explanation, however, it is little better than a synonym for licence or caprice. This phrase and others, such as 'intuitive expression' and 'spiritual expression,' are some of the counters of later-day æstheticism which, in my opinion, are responsible for much of the recent hysteria in art. Good craftsmanship, the mechanics of technique and emotional and reasoned balance go begging while loose ideas of this type hold the field. We do not have to go far to find the logical results of an unqualified acceptance of this sort of liberty, as several art exhibitions in London in recent months attest. Design incoherence, frivolity, stark madness have struck me as characteristics of these displays. In the final analysis, however, as I am not prudish about these matters, I am inclined to accept them in preference to the stolid and stupid creations of realism which have held official sanction for many years.

"Mr. Lethaby says I use elaborate webs of crossing lines 'much as we are accustomed to in the older systems of triangulation,' and 'if the skeleton constructions do not hit off one point they will another—at least *nearly*'; also 'elaborate nets of lines will catch any form whatsoever.' This critic says he heard one of my lectures and that he has read the first two numbers of *The Diagonal*. His statements here are proof positive that he either did not understand what he heard or read or that he is deliberately twisting to belittle the dynamic idea. I prefer to believe the former. Even a beginner in the study of dynamic symmetry knows that not one word of these statements is true. In dynamic analysis no diagrams or lines whatsoever are used until the symmetry grade of a design example is positively determined. After this is done the nature of the areas which constitute a theme of dynamic shape in an organism or a design is explained for the student by certain principles of construction. If this critic had given some attention to these principles, I should not now be writing this protest. Mr. Lethaby has mistaken the shadow for the substance.

"Again he says:

'All the while, however, the real Greek system of setting out their building work is being made clear by other ways of measurement. The first great step was made by the determination of the Greek foot, which it has been shown was *about* 11.65 English inches. *For rough practical purposes* add one-third of an inch to the foot and three inches to every ten feet given in English measure and you will *closely approximate* to the demensions in Greek feet and fractional parts. Dorpfeld obtained the value of 295.3 mm. from the Parthenon; and 293.3 mm. has been deduced from measures actually figured in the drums of the columns at the temple at Branchidae in Asia Minor. The examples examined with this unit all show that those who designed and 'set them out' had a liking for simple dimensions in round numbers, thus the cella of the Parthenon is exactly 100 ancient feet long and the height of the main columns being *about* 34.2 feet *approximate* closely to 35 ancient feet.'

"I have quoted here at length and italicised some of the words to show what extraordinary looseness seems to satisfy this critic. I should be ashamed to advance an explanation which depended upon such a flimsy substructure. Mr. Lethaby, I regret to say, is not alone in misinterpreting the facts of measure in Greek design. Archæologists have wasted much effort in recent time in their efforts to determine the exact character of ancient units of measure, overlooking meanwhile the astonishing fact that for every measurement they find there are a hundred others in the same example which are incommensurable with it. This is really the crux of the situation. If the cella of the Parthenon is 100 feet long, what is the width or the height? The ground plan of the Parthenon, as a rectangle, furnishes us with side and end which are unmeasurable—one cannot be divided into the other. And this is true of Greek design in general. If it were otherwise, Greek design would have been understood long ago. This unmeasurableness is not true of our design or any other design laid out with length units. It makes no difference what unit of length is used—if lines are incommensurable they remain so. The side of a square may be expressed in round numbers, but a diagonal, in relation to a side, is incommensurable, permanently so, whether the square be described by a Chinaman, a Hindu, an Englishman, a Greek or a Lapp. I imagine I have measured more examples of Greek design than most investigators, and I find that over 95 per cent. of the lines obtained from it are incommensurable. This is perplexing because, as practical men, we know that it is impossible to lay out a design unless we use a system of measurement which produces commensurability of some sort. Suppose we take the ground plan of the Parthenon as an example. We find that practically all the lines of this plan are incommensurable one with the other. If, however, we interpret the plan as an area, this incommensurability by length disappears and a delightful arrangement of measurable area is disclosed. Moreover, we may take the front and side elevations, the columns, the details of every character and find that the same condition prevails throughout the building. And there is nothing in the structure which may not be expressed in terms of the ground plan. Are we to ignore this peculiar situation because it does not seem to conform to the opinion of Mr. Lethaby and a few others? The situation we find in the Parthenon exists in over 90 per cent. of other classic design examples. There is no 'about' or 'approximately' or 'roughly' or 'nearly' as the interpretation is absolute within the error of workmanship as we find it in the examples. Greek design is the most precise design ever made, and any interpretation of it must be equally precise. This is my standard, and I feel that I have a right to demand that critics conform.

"It has been stated that the flank of the stylobate of the temple of Zeus at Olympia is exactly 200 Olympic feet long. But, according to the measurements made by the authority who maintains this, the front length cannot be divided into it; neither can the front or side of the cella, or any other detail. Yet, if we ignore these incommensurable lengths and treat the podium as an area, we again, as in the case of the Parthenon ground plan, find it is commensurable; moreover, it is an area theme existing in scores of other examples of Greek design.

"When the ingenious and simple-minded Americans had their attention drawn to dynamic symmetry they did not attempt to belittle the idea or twist the facts to suit their dispositions; they went to the museum to see if what I maintained were true. Finding the facts even understated they applied their energies to studying the principles involved. Mr. Lethaby writes of 'Greek Afternoons at the British Museum.' As my statements may be shown to be either true or false by Greek examples of design in the Museum, I marvel that he has not thought of this simple method of test. As he apparently has not, however, I took steps to see that it should be made. Mr. A. H. Smith, Keeper of Greek and Roman Antiquities at the Museum, promised me that 75 examples of Greek design, 25 black-figured vases, 25 red-figured and 25 bronzes, would be measured, and the results made accessible to the public. These examples are to be selected by the Museum staff, and I am to know nothing about them until the work is done.

"We are assured that Stonehenge is 97 English feet in diameter, and the Book of Genesis is given as authority for the proportions of Noah's Ark. How we can have an intelligent discussion of design bases if illustrations of this character are to be permitted or seriously advanced is beyond me. I imagine Lord Fisher would be interested to see an application of dynamic symmetry to battleship design, and I do not believe he would confuse the dynamic force that drives the ship with the static design of the ship itself. The linear system has not been successful in disclosing the real proportions of the bird. The area system will do this perfectly, but if the Noah's Ark precedent is to prevail we must shelve this interesting fact and remain in the rut. I can readily understand how annoying it is to the old men who are comfortably seated before the fire and peacefully resting on their past efforts to have a strange intruder disturb their rest. It is irritating, but the young men refuse to look at it that way.

"Mr. Lethaby seems to have given more attention to an unfortunate wording of an advertisement in *The Diagonal* than to the substance of the review. When I first saw this advertisement I mentioned to an English friend my fear that this would be

the first thing the critics would seize upon. I was assured that, as it was so patent that it was a matter over which I had no control, the critics would not take such an advantage. The result, however, shows my fears were justifiable.

"At a meeting of architects, painters and craftsmen in London recently I listened to an Englishman belittle the dynamic idea most patronisingly. He made the point that because the most eminent scientists in the country had been unable to measure the skeletons of two celebrated racehorses it followed that it was nonsense for me even to suggest a method of skeleton measurement. It was not necessary for me to reply to this as, before I had the opportunity, a distinguished Englishman took the floor and said much better and more effectively what I should have wished to say. My experience in England this winter gives me great comfort, as I found that that glory of civilisation, British fairness, honesty and fearlessness still persists with the majority.

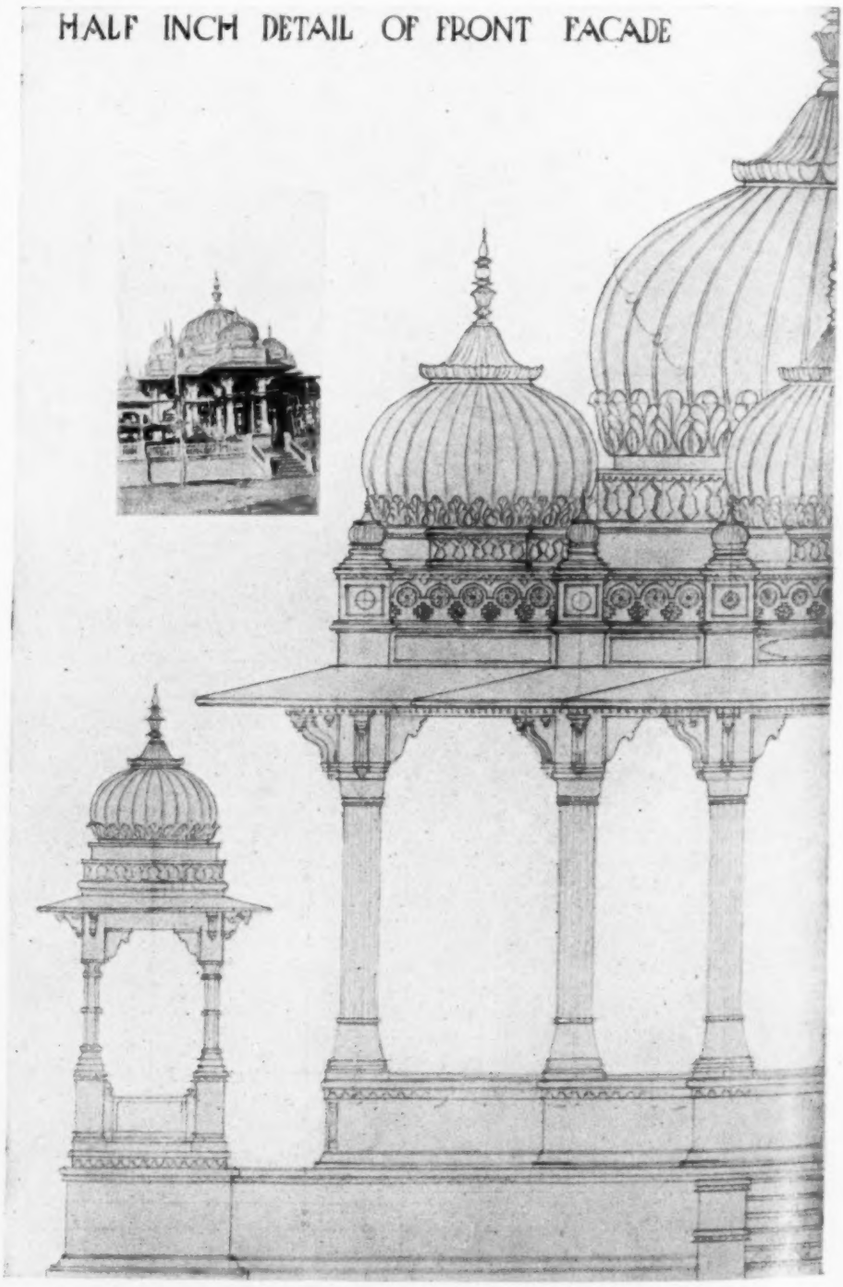
"Another London critic, early in the dynamic excitement, jauntily undertook to render the facts of dynamic symmetry in algebraic formulæ. Like Mr. Lethaby, he apparently could not 'wait and see.' Oblivious to the fact that this could not be done, as his formulæ, if carried out in symmetry terms, would have produced a man over 25 feet high, he brushed aside the facts of design and did his best to nail me as an æsthetic astrologer. The attempt failed for the very simple reason that design as I am considering it has, for the moment, very little if anything to do with æsthetics. I shall do my best to discourage æsthetic speculation, because I feel that an over-plus of it is a sure mark of creative degeneracy.

"And now comes *The Builder* itself. It isn't possible that it understands the simple facts of dynamic symmetry, or it would never connect root-two with a god. However, as the subject is new this may be overlooked. *The Builder* implies that I know nothing of the nature of art. This is not news to me. But I marvel when I find so many who do know, at least they would seem to. In my innocence I supposed, when I undertook a close scrutiny of design, that the logical source of study was that furnished by examples of the work of the world's greatest designers, and nature. Possibly, I made a mistake and could have saved much time and labour had I first consulted the oracles. *The Builder* confuses art, as it is understood to-day, with design. I am interested in the latter, and it is not my ambition to create either a Parthenon or a god. You say the god appears in many guises and that I might not recognise one if I saw it. This may be admitted, but what has it to do with an effort to understand figure construction, or any part of a figure, say, for example, a head? There is sometimes a demand for a super-head. An occasional Britannia, for example, with a head that might compare favourably with the head of a good Greek figure, would not be amiss, I am sure. Or is this to be a matter of 'Divine Liberty'? *The Builder* hews closer to the line when it says that modern art is very much on trial. I believe it wasted effort to try to build up a superlative art without first providing a sound basis of good craftsmanship. The flowering of Classic art was made possible by generations of the greatest craft practice the world has known. The Greeks seemed to think that nothing was too mean to be neglected. If, instead of devoting our energy to the production of hot-house absurdities which have no connection with the life of a people, but depend for existence upon dilettantism and speculation; instead of plundering the design products of the past or being fearful of the loss of individualism, we should use more common sense and endeavour to understand the principles of design to the end that we might create a sound and individual craftsmanship and thereby be able to look to the future fearlessly and unashamed, I feel we should be doing something really worthy. Because I believe that this way lies artistic salvation, I am devoting my energies to trying to understand Greek craftsmanship. But I am taking nothing for granted. Greek art must check with nature or I shall be sceptical.

"Dynamic symmetry is rapidly taking us into the heart of Greek design, and the results of my work are being verified in every detail by others competent as scholars and archæologists. We are now picking up the work of individual designers of the archaic and transitional periods, with the result that plenty of examples are being brought to light which show that men like Tleson or Nikosthenes began their careers by using a commensurable linear measuring scheme, which I have termed static, and later changed to a system of measuring by commensurable areas, which I have termed dynamic. This latter scheme is most interesting, as it is the scheme which modern botanists have found in the phenomenon of leaf distribution."

"Jay Hambidge

"New York."



Queen's Tomb, Jaipor. Measured and Drawn by Mr. P. R. Udwadia.

THE LONDON SOCIETY.

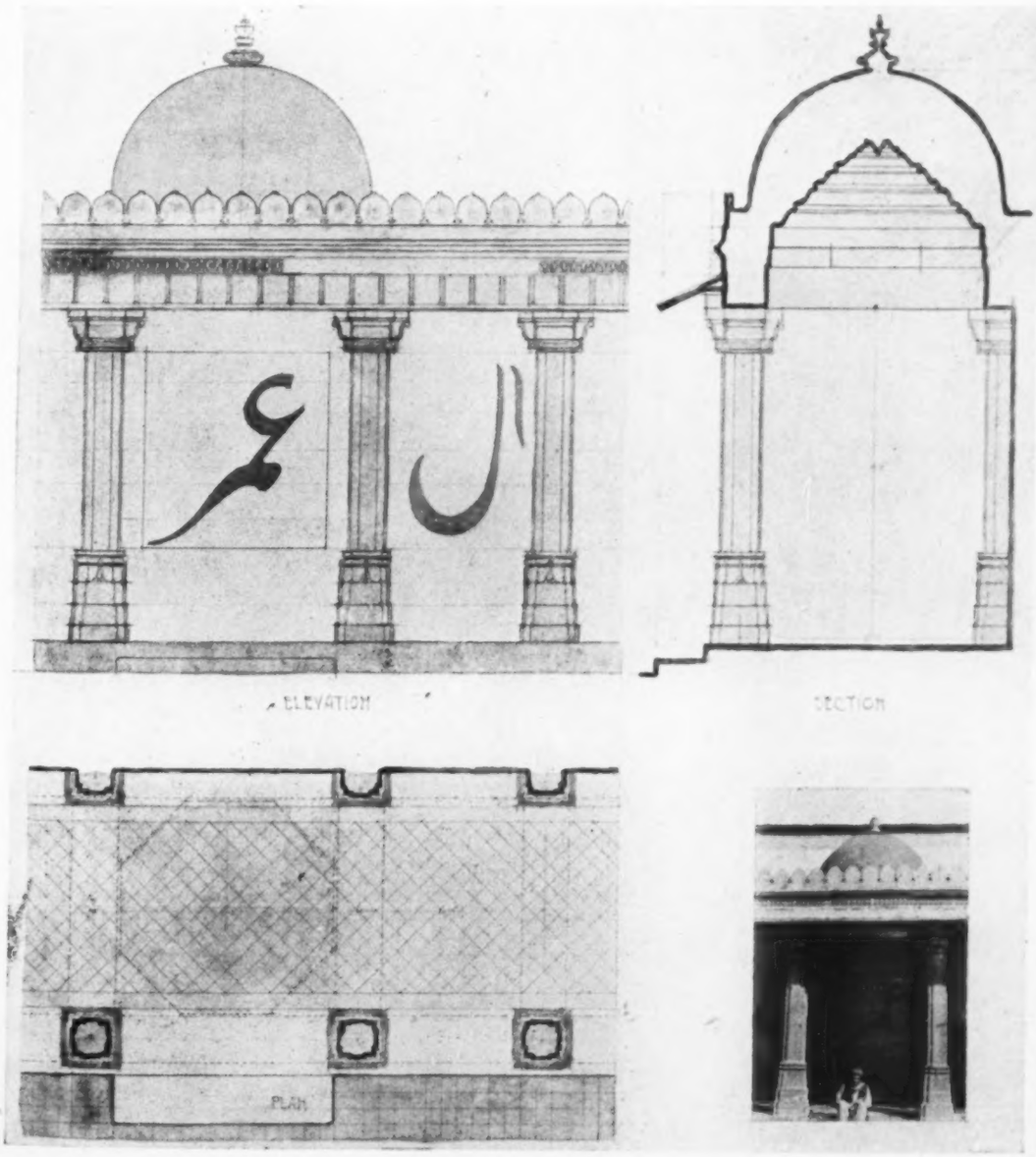
ART AND THE CITY.

At a meeting of the London Society last week, Miss Amelia Defries read a paper on "Art and the City," in the course of which she said that even the architect must see his work as related to the functions of the community, and the dreams of the artist must be those of the artificer in so far as the whole civic scheme was concerned; all parts related to the whole. It was often said that men to-day who might in the past have been artists took to mechanical occupations; but there was no reason to put the machine beyond the realm of art. The man who could produce and design a triumphant train, or a beautiful 'bus deserved to be crowned as a civic artist. In the matter of railways and stations we had much to learn from America.

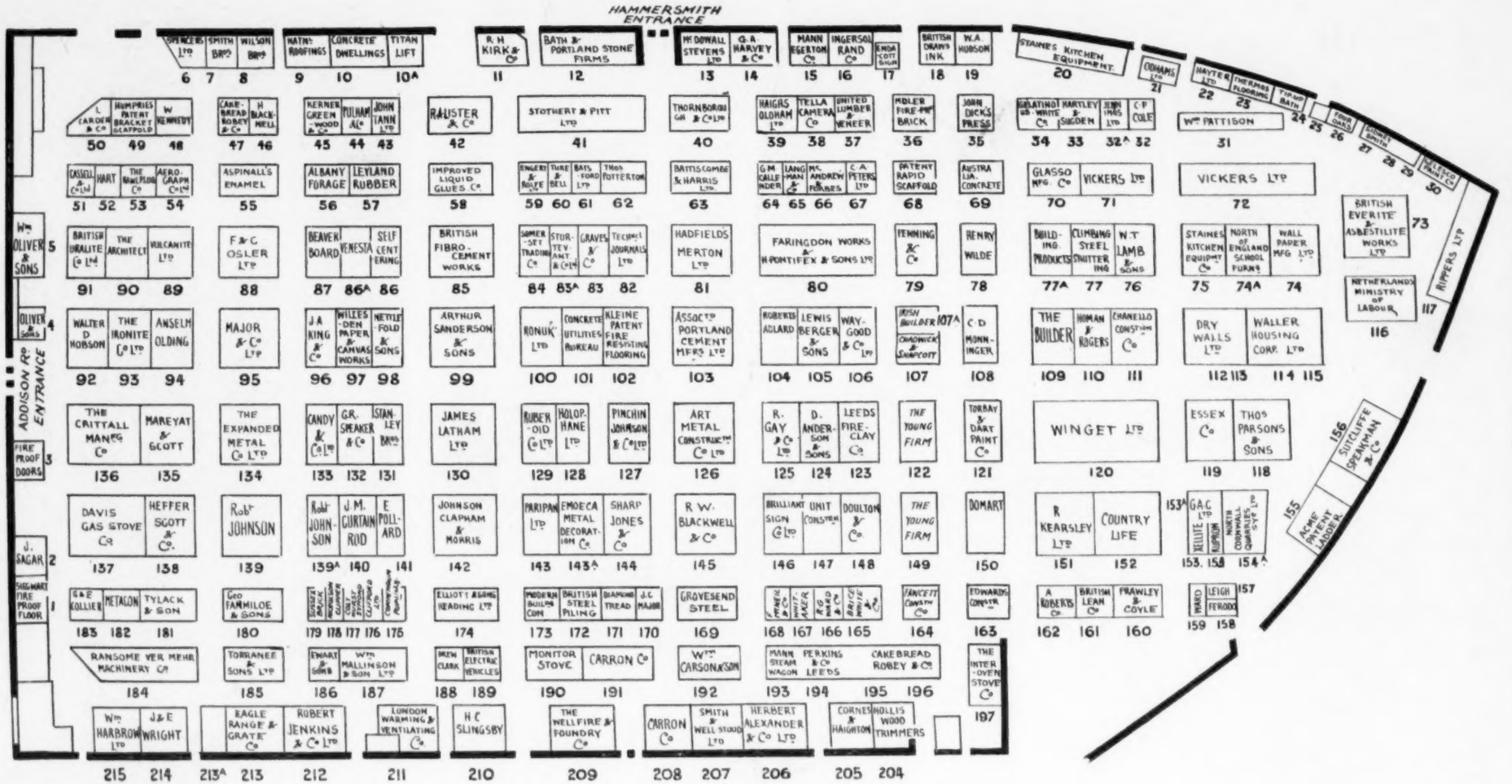
With care and expert knowledge it should be possible to make a better coloured brick for general use than we had at present. We used a hideous coloured brick—a bad red or else a bad yellow — and accentuated this by painting the woodwork white and putting on a roof of vile hue. We sometimes touched up this mixture with a shade called "brick" at the eaves, or with any other unsuitable, bad colour that was at hand. Bad colour should never be at hand. In many cases the shape of the houses was not so ugly as the colour of the materials of which they were built.

In regard to colour in any city, much must be done by the artist, as gardener. In certain parts we had beautiful flowers and trees, but we could do with more. Every street needed both, but few streets had either. Where it was impossible, owing to width, to make way for trees, we could at least have civic window boxes filled with shrubs or flowers.

Numbers of new leagues and societies had been set up in London since the war which bore upon the arts. All were applying for support and financial backing to more or less the same groups of rich patrons, but we must look on the organising of art matters as we looked on the organising of trade. Art leagues should be on a business basis and even make a profit. That art was a paying business Bond-street proved. Art should not be commercialised, but it should be so organised as not to require patronage or doles. The middle man in art must be absorbed into the national organisation, which must be regional and civic. There was one form of organisation which had been tried and which in its day was not found wanting, and that was the guild. Whatever its drawbacks, the guild could be adapted to modern life and a federation of guilds could put art on a proper footing, in which all elements, whether experimental or conservative, whether for research in art or for the most radical expression of the most advanced ideas and techniques, whether traditional or evolutional, or both at once, could be welded together and formed into a national unity for the purpose of trade in art, and also for spreading the civilising influence of the arts in cities and villages. Such an organisation might even revive old institutions and bring fresh life to such societies as had of late taken a greater interest in looking back than in looking at the events of our own day in so far as they affected the arts. Tradition and fresh endeavour should go hand in hand, and art would become again a power in the land.



Jami Masjid, Ahmadabad; Detail of Corridor.
Measured and Drawn by Mr. P. R. Udwadia.



Ground Plan of the Building Trades Exhibition at Olympia.

THE BUILDING TRADES EXHIBITION.

A GENERAL IMPRESSION.

Seven years have elapsed since the last Building Trades Exhibition was held at Olympia, and in that long hiatus—rudely breaking the intended biennial sequence—events of such magnitude have occurred that nothing has escaped their reverberations, and the observant visitor on entering Olympia will at once be aware of a tone which differentiates this, the first post-war Exhibition, from its predecessors. It is not that this Exhibition shows any failure to maintain the high standard which has been displayed in previous years; rather it may be said that earlier standards of excellence have been surpassed. Many causes contribute to this impression of a changed tone, the absence of which, seeing what has happened in the intervening years, would, indeed, be more surprising than is its presence.

In the first place there is a feeling of earnestness of—as they say—"getting down to it," or, to use an older phrase, of putting the shoulder to the wheel. Before the war the impression was rather one of ease, of prosperity, of display, and even of extravagance; this has now given place to that of a great industry determined to regain its place in national affairs by hard work, and it is to be hoped that such an attitude may be taken as indicative of that of the whole nation. This note of earnestness is largely apparent by the class of exhibits, which have about them so little of the luxurious, of the superfluous, and so much of the essentials of sound and economical building. It is a truism to state that the history of a nation is reflected in its architecture. What, then, is more natural than that the architecture of a nation recovering from a great war should display something of the need for seriousness and economy that is expected at such a period, leaving the more lavish embellishments for times of greater prosperity? And this is no reflection on the "art" of architecture; indeed, the measure of this art is to a large extent the intimacy between architecture and national conditions.

Another contribution towards this new tone is the growth in the number of exhibits of a mechanical nature. One effect of the war has been to overcome many ancient prejudices, and of these few were stronger than that which existed against the use of mechanical aids to building. This prejudice was nurtured by many parties; by the contractor, who often looked askance at anything new which he could not altogether understand; by the operative, who thought that the development of mechanical power might lead to unemployment; and by the architect, who considered that the use of mechanism was incompatible with good building. All such feelings are now swept aside by the urgency of the situation, and anything that tends to increase the output in the building industry, where it is in no way detrimental to sound construction, is welcomed by all. Thus there are many exhibits of concrete block machines, climbing shuttering, concrete mixers, standardised windows and rapid scaffolding.

Already at earlier exhibitions substitute materials had begun to make their appearance, but the sudden shortage of certain materials, which is the direct outcome of the war, has given enormous impetus to inventiveness. So it comes about that, at any rate for small buildings, possibly with the exception of Portland cement no material is now indispensable; brick, timber, plaster, tiles, slates, stone—all the usual constructional essentials are replaceable by substitute materials, many of which make their official *début* to the public at the present Exhibition. While observing these changes, the visitor cannot fail to be struck by the enormous development of concrete as a material that can be used to an extent that would have appeared amazing a few years ago. Examples are patent on every side of walls constructed with concrete blocks, with *in situ* concrete, with roofs of concrete, with doors and window frames of concrete, with manholes and sewers of concrete; indeed, there seems scarcely a purpose to which this material cannot be adapted.

Not satisfied with the production of synthetic and substitute materials, the inventive instincts have been stimulated by the various new systems of construction, and these find a prominent place at the Exhibition. The building unit varies from the comparatively small and adaptable to the largest, in which the whole house appears as the unit, and concerning which there is perhaps a certain cause for alarm. Mass production and standardisation of parts may be a necessity to which exception cannot be taken, but there must remain the scope and freedom to design the house; to put the window just where it is required for that particular side in order to obtain the best view, even though the casement be standardised; to hip the roof even though it be covered with concrete tiles; or to throw out a bay-window to catch the early morning sun, even though the walls be built of standardised concrete blocks. In demanding such freedom the designer is only doing what is necessary to preserve and continue the traditions of the past, which no emergency should be allowed to sever.

In arranging an exhibition of such magnitude considerable difficulty must be experienced in obtaining a good balance of the various interests; this has been most happily achieved at Olympia. Housing has not been allowed unduly to predominate, although occupying, as it should at the present moment, an important position. Despite the ban on luxury building, other work must proceed concurrently with housing. Again, a happy balance is struck between the exclusively contractor's interests in such matters as plant and equipment, and the exclusively architect's or layman's interest, such as in garden ornaments, furniture, &c., about which we shall have something to say in our next issue.

THE OPENING CEREMONY.

The Exhibition was formally opened by Dr. Addison (Minister of Health) on Saturday last.

The chair was occupied by Mr. H. Greville Montgomery, the organiser of the Exhibition, who said that if Dr. Addison had been present during the work of preparation he would have seen houses springing up with lightning rapidity, and would perhaps have asked himself why, if it was possible to build a cottage with three bedrooms, sitting-room, bathroom, kitchen, &c., in ten days, inside that hall, it should not be possible outside also. The advantage enjoyed there was that the financier, the owner of the soil, the architect, the builder, and the artisan were all working together for a common end. If Dr. Addison could persuade all the parties to talk matters over together in that hall he thought the housing question would be in a fair way to be settled.

Dr. Addison, referring to the difficulties experienced in regard to housing, said that so far as civilians were concerned these were the war. Tenders as they came in month by month showed a marked tendency to increase in amount. There was considerable difficulty in local authorities and others obtaining the necessary funds quickly enough. He had cases relating to several thousands of houses where the tenders had been approved, but the local authority could not sign the contract for want of funds. It was as urgent a patriotic duty to provide funds for housing as it was during the war to help in the flotation of war bonds. The urgency of the problem had been accentuated by the Department having approved tenders for nearly 100,000 houses, and there was nothing to prevent the work being pressed on with all speed. The number could easily be made 200,000 by the end of June, but he proposed to wait until the first 100,000 were built. There was scarcity of labour and materials as well as funds, and the housing schemes alone were sufficient to absorb practically every bricklayer in

The "Builder" Stand.

the country. There had been a meeting at the Department that morning for the first time with the representatives of the trade unions concerned, appointed to see what they could do to help. He looked for assistance from the use of alternative materials and methods, and that was the chief value of the Exhibition. The quick erection of a cottage in the Exhibition was a fine performance, but it had been achieved regardless of expense. He appealed to the trades concerne to help in providing materials for housing at a cost that was not exorbitant. He was sure they were all pleased to see Mr. Montgomery in the chair. Mr. Montgomery had been largely responsible for promoting the annual Building Trades Exhibition for the past 25 years, and had rendered incalculable service to the building industry.

Mr. John W. Simpson, President of the Royal Institute of British Architects, in moving a vote of thanks to Dr. Addison for his presence, said that the building industry came home to the people more than any other industry, both in their private life, public life and commercial life. Dr. Addison had asked for help in the matter of housing, and he (Mr. Simpson), speaking on behalf of architects, knew they were perfectly willing to help. Architects were only too anxious to help, and the services of the Building Industries Board, of which he was chairman, were always at the disposal of the Ministry.

Sir Henry Norris, M.P., seconding the vote of thanks, said that no one during the past twelve months had put more energy and time into the housing problem than Dr. Addison. He might have called his attention to some of the reasons why the schemes had not progressed more rapidly, but did not think that that was a proper occasion for criticism.

THE STANDS.

In our last issue we gave particulars of some of the exhibits as a guide to visitors, and we give herewith a description of the chief exhibits on the stands. Our notices will be continued next week.

BUILDING CONSTRUCTION.

On the stand of the Channello Construction Co., of 8, Warwick-court, W.C.1, is a partly-built cottage constructed on the "Channello" system, which has been approved by the Ministry of Health for use in State-aided housing schemes. The concrete blocks are made with a flange at each end, and all four sides are grooved to ensure good joints. The blocks are laid so that the joints and flanges alternate in each course, but with the flanges of the exterior and interior blocks corresponding, thus forming vertical piers throughout the height of the wall at intervals of 18 in. or 24 in., according to the length of the block. The flanges are practically the whole thickness of the wall, forming an exceptionally large area for jointing. The floors are formed of slabs on steel joists. The blocks are made on a new type of machine, constructed for both power and hand, by which it is claimed that 420 blocks can be made in an 8-hour day. These machines are for hire or sale.

In the system of concrete wall construction used by "Dry Walls," Ltd., of 168, Regent-street, W.1, wooden shuttering in small sections is fixed to brick or concrete piers and a sheet of vertical dampcourse which runs through the centre of the wall is attached to the shuttering by clamps. After the concrete has been poured and rammed, the shuttering is released and used for another section, the dampcourse remaining embedded in the centre. The dampcourse is overlapped at each section, and a monolithic, damp-proof wall is rapidly constructed. If necessary, reinforcement can be suspended from the top of the shuttering and built in the same way and at the same time as the dampcourse. The system is the invention of Mr. Maberley Smith, and has been approved by the Ministry of Health.

The small asbestos sheeting and timber frame building erected by Messrs. Thornborough & Co., Ltd., of Hampden-lane, London, N.7, can be well adapted to a number of purposes, such as a bungalow or a hall to an existing house. The stand also demonstrates doors and windows which are being manufactured for the Director of Building Materials Supply, and revolving shutters and sections of horticultural buildings in wood and asbestos sheeting.

The Forrester-Marsh system of metal forms or shuttering shown by Edwards Contruction Co., Ltd., of Siebert Works, Westcombe Hill, S.E.3, is a method of constructing hollow or single walls or slabs with a minimum amount of labour and timber in reinforced or mass cement. The shuttering consists of two sections of metal sheeting, one flat and one corrugated, secured together to form a rigid whole sheet, which is placed, when constructing a wall, in conjunction with other similar sheets in the desired position in opposite planes, and held apart the required thickness of the wall by means of cement or concrete "spacing blocks." Outside the sheeting temporary wood battens are placed, and the whole held rigidly together by wrought iron bolts passing through the "spacers," the lapped joints of the sheeting and the temporary batten. The "spacers" are connected longitudinally by metal rods, which in turn act as a reinforcement, and to which further reinforcement may be secured if desired. The concrete is poured and tamped in the usual manner, and, after time has been given for setting, the sheeting is removed and the hollow core of the "spacers" filled in. Internal and external angles of any degree of inclination can readily be formed. A "hollow" wall is constructed in a similar manner, but with double the number of sheets and "spacers," and with tie bolts in position to hold the two leaves rigidly apart.

The well-known hollow Siegwart floor (Siegwart Fireproof Floor Co., Ltd., 231, Strand, W.C.2), of which a model is shown, consists of a series of hollow granite concrete beams grouted together side by side. Each beam is reinforced and is made the exact length to suit the span and load required for each floor. By this system concrete floors are constructed without the use of timber centering.

The stand of Johnson's Reinforced Concrete Engineering Co., Ltd., of Lever-street, Manchester, gives a comprehensive display of the concrete and brickwork reinforcing materials manufactured by the company. The "Keedon" system of columns consists of four vertical steel rods connected by hoops, which are twisted round each upright and tightened with wedges. The system as applied to beams consists of rods and stirrups, the stirrups being attached to the rods and kept in position by wedges, or keys. It is thus possible to move the stirrups to any position along the bar, and the system dispenses with the setting and spacing of loose bars, whilst at the same time forming a rigid reinforcement which is not displaced when the concrete is being rammed. The "Lattice" system is designed for the reinforcement of floors, roofs and tanks, and is being extensively used in road construction.

The timber frame cottage exhibited by the British Everite and Asbestilite Works, Ltd., of 29, Peter-street, Manchester, is covered externally and internally with flat and corrugated "Asbestilite" and "Everite" asbestos-cement sheeting. This material, of which large supplies are available, is water and fire proof, a non-conductor, and keeps the interior warm in winter and cool in summer.

The Grovesend Steel Ceiling Co., of 29, Great St. Helens, E.C.3, are showing some artistic designs in stamped steel ceilings, wall linings, dadoes, cornices, mouldings, &c. These decorations are claimed to be cheaper than plaster work for interior uses, and can be made to any design.

"Thermos" flooring, shown by the Thermos Flooring Co., Ltd., of 85, North Oswald-street, Glasgow, is a seamless, damp, fire and vermin resisting material, which may be laid on any foundation and used for the renovation of old floors. The surface may be finished with a trowel or polished as desired, and the stand demonstrates the effect which may be obtained by the use of the material in tasteful colours.

The British Fibrocement Works, Ltd., of Erith, Kent, have erected a building to illustrate the uses of the asbestos-cement sheeting and slates in which they specialise. The roof is covered partly with "Fibrent" corrugated sheeting and partly with "Fibrent" red slating. The walls are composed of flat, scalloped and corrugated sheets, both plain and coated with rough-cast. The floor is of ¾ in. flat sheets fixed direct to the joists. These sheets are very light, fire-resisting, and do not require painting. They can be cut to any size with a hand saw. It is claimed that with the use of this material, owing to its lightness, the rafters may be spaced 2 ft. 6 in. apart, and that a saving of 40 per cent. in the cost of roof timbering is effected.

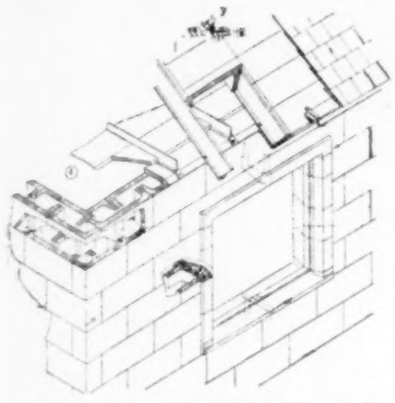
The expanded-metal concrete reinforcement shown by the Expanded Metal Co., Ltd., of York Mansion, York-street, S.W.1, is manufactured from mild steel sheets and plates. It is machine made, of meshwork formation, and has no loose or separate strands. The

Model by Mr. John B. Thorp.

Model of a Canadian House.

MR. BAILLIE SCOTT, Architect. (An exhibit on the *Builder* Stand.)

junctions between the meshes are uncut; thus the members or strands in a sheet of reinforcement are rigidly connected, and have continuous fibres, and there are, therefore, no loose ends to be displaced when the concrete



"Channello" Concrete Block Construction.

is being laid and tamped. Where sheets overlap, the meshes interlock, and a continuous reinforcement of any length may be obtained. This material, which is supplied in rolls, is specially recommended for road work, and is being largely used for that purpose.

With the use of the materials manufactured by the Self-Sentering Expanded Metal Works, Ltd., of 2-3, West-street, London, E.C.2, reinforced concrete walls, floors, &c., may be built without the use of shuttering. For wall construction, a skeleton frame of timber or steel is erected, the members being vertical and at about 4 ft. centres, and to this the expanded metal is clipped. Cement is plastered to a thickness of 1½ ins. to the outside of the reinforcement, and fibrous plaster slabs, coke-breeze concrete or building boards are fixed inside the framing. The effect is a cavity wall, with an exterior of reinforced cement and an interior of porous concrete or wall-boarding. For concrete floors, an expanded metal of close mesh, stiffened at close intervals with steel ribs, is used. The closeness of the mesh enables the material to retain wet concrete and thus eliminates the necessity for boarding. At the Exhibition a building in different stages of erection shows the use of the material.

"Anti-Hydro," shown by the Adamite Co., Ltd., of Regent House, Regent-street, W.1, is a concrete hardening and waterproofing material. It is claimed that the addition of the liquid to the water with which concrete is mixed results in a material which is as damp-resisting as asphalt. It is impervious to oils and grease, and forms a dustless surface of increased hardness. It is also claimed that with the use of "Anti-Hydro" concrete work can be carried out when the thermometer is below freezing point. The solution has been extensively used in America, and is being used in the foundation work now in progress at Messrs. Selfridge's premises in Oxford-street.

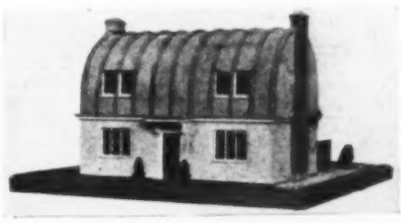
The British Reinforced Concrete Engineering Co., Ltd., of 1, Dickinson-street, Manchester, is showing examples of their well-known "B.R.C." reinforcing stirrups, hoops and helicals and "B.R.C." fabric. The stirrups are shown in position on steel bars forming the skeleton reinforcement of a beam, and the hoops and helicals on a skeleton beam reinforcement. "B.R.C." road reinforcement and "Brictor" reinforcement for inserting between the courses of brickwork, are also shown.

The British Uralite Co. (1908), Ltd., of 8, Old Jewry, E.C.2, is showing a timber-frame building covered externally with "Asbestone" plain and corrugated sheets, lined inside with "Uralite" sheeting and roofed with "Asbestone" tiles. This material is being largely used by the London County Council, H.M. Office of Works, and Government departments, and is used for its fireproof and damp-proof qualities. It is very light and easily fixed to the framework.

The stand of Messrs. MacAndrews & Forbes, Ltd., of 2, Broad-street-place, E.C.2, is attractively panelled out with "Fiberlic" wall-board. This material is being widely used as a substitute for lath and plaster and matchboarding and as a ceiling covering, and with its use some very effective results are obtained. It is very durable, and, in fact, it is claimed that it will last as long as any building in which it is used. Its fire-resisting properties are very high, and it may be coated with paint, varnish, distemper, &c.

The stand of Messrs. Venesta, Ltd., of 1, Great Tower-street, London, E.C.3, is decorated with ply-wood panelling for board-rooms, drawing rooms, dining-rooms, &c., specially designed to harmonise with furniture of various periods. A ¼ in. thick parquet flooring, for covering worn wooden floors, and blocks 1 in. thick for covering concrete floors, are also shown. These floorings are supplied in herringbone and in any other designs, and are stated to be sound resisting and non-absorbent. "Venesta" plywood panels are made in various woods, and the firm has large quantities in stock.

The Duplex Sheath Construction Co., of 6, Moorgate-street, E.C. 2, are showing a portion of a building on a new system of construction. The "Duplex Sheath" method consists of a steel structure covered with two sheaths of metal lathing, so disposed that each sheath can be independently coated with concrete by means of a cement gun, leaving a continuous cavity between the walls. The weight is carried on



Duplex-Sheath Construction

the steel stanchions and foundations are only needed under these supports. A channel iron is fixed on each side of the stanchions and runs horizontally around the building at the first floor level. The inner channel takes the concrete floor, and the outer channel takes the roof members. These channels act as carriers for a small wheeled carrier upon the projecting axles of which are balanced two rolls of metal lathing, which unwind themselves as the carrier is moved around the building and allow the lathing to be fixed with a minimum of labour. Openings in the wall are cut out of the lathing and temporary shuttering placed in the sheaths. When the concrete is discharged against the shuttering the lathing is entirely embedded. After the lathing has been covered to the required depth, the wood shuttering is drawn upwards to the first floor level and removed.

Messrs. C. R. Speaker & Co., of Eternit Wharf, Stevenage Road, Fulham, S.W., have constructed their stand on the "Trellit" principle in various stages. It is a light steel construction, made in standardised units, suitable for bungalows, garages, hospitals, and all types of one-story buildings. The light, patent, steel framework is treated with bitumastic non-corrosive paint. The wall and ceiling cross pieces are filled with 2 in by ¾ in. wood battens, to which "Eternit" sheets, are nailed. The joints are covered with wood overlays, thus forming a rigid wall with 5 in. air space. The framework is assembled at the Company's works in sectional units "contracted" on a patent system, and packed in sections measuring 16 ft. by 2 ft. They are capable of being re-expanded on a site in a few minutes, and the roof trusses placed in position. The roof is constructed of welded patent steel trusses, having a pitch of 30 degrees, spaced at 8 ft. centres, and fitted to the double column of the wall by means of lugs and nogging pieces. Steel purlins are spaced at 3 ft. 6 in. centres and filled with wood battens, to which 1 in. boarding is nailed. On this, red "Eternit" tiles, 15½ in. by 15½ in. are fixed. One of the great merits of the system is the speed with which it can be erected, and a second advantage is that any two men of average intelligence can do the work. "Eternit" tiles are composed of asbestos and cement and have been well known for the past twenty years.

The stand of Messrs. C. W. Langmaid, Ltd., Shaftesbury-road, East Ham, is an attractive display of the product they manufacture, as the floor was covered with their composition. One of the features of the flooring is that it can be made in any colour, and another is that no sawdust is used in the composition. In addition to plain colours, imitation marble and mottled designs are supplied. The company lays emphasis on the need of a good foundation for the flooring, and suggests that the composition covering may be laid in one layer of an average thickness of ¼ in. on concrete and ⅜ in. on wood. To obtain an even surface wooden laths of the thickness required are laid down on the bed, dividing it into squares. The composition is then ladled on, and when a square has been filled the laths are removed and placed to form another square. When the whole area is covered, and after the coating has hardened sufficiently, which takes from twenty-four to thirty-two hours, it is scraped or planed smooth. To render the floor water proof it is coated with linseed oil, and it can afterwards be polished. It can be laid on any solid foundation, and is recommended for the renovation of floors which are worn to an uneven surface. The flooring has a very good appearance, is warm, resilient, and is stated to be vermin proof.

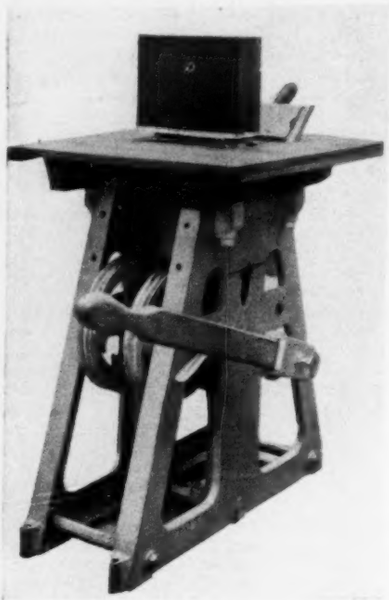
Messrs. Harvey & Co., Woolwich-road, S.E. 7, have a representative exhibit of the various items of metal work in which they specialise. Surrounding, and indeed forming, the entrance to the stand are many patterns of their perforated metals, some of the designs being particularly good. On the stand itself are a number of varieties of inlet and outlet ventilators, small weather vanes, steel shelving and lockers, patent tanks, cylinders, cisterns and so forth. There are in addition various kinds of rain-water apparatus, made from stamped steel. Other items worthy of notice are washing machines, while examples of woven wire are to be found on the front of the exhibit.

CONCRETE MACHINERY.

A cement gun is shown in operation by the Ingersoll-Rand Co., 165, Queen Victoria-street, E.C. The gun cement applies fine concrete to frames of metal reinforcement between timber or pre-cast concrete posts, enabling a strong wall to be erected in a short time with a minimum of labour, and, it is claimed, at a cost below that of brick or moulded concrete construction. In an eight-hour day an area of from 1,500 to 2,000 sq. ft., 1 in. thick, can be covered with one cement gun.

"Ingersoll-Rand" Cement Gun.

On the stand of Mr. C. F. Cole, of Alperton, Middlesex, is shown a new concrete block-making machine for which a patent has been applied. The blocks are made on edge and tamped by hand. When made, they are lifted above the level of the platform by means of a lever at the side of the machine, which



The "Winch" Block Making Machine.

revolves two winch wheels from which wire ropes run over pulleys to the plate at the bottom of the mould. There are no cogs in the machine to get clogged with loose concrete, and the operation is extremely simple. As the blocks are made on edge, less space is required for their storage whilst they are maturing. This machine is one of the cheapest on the market.

The "Léan" concrete blocks (The British Léan Co., Ltd., 11, Suffolk-street, S.W.1) were recently illustrated and described in our pages. These blocks are made with two or three air-spaces, resulting in a wall which is dry inside and keeps the interior temperature equable. The machines are for hire on a royalty basis.

The Australian Concrete Block Machine Syndicate, Ltd. (608, Salisbury House, E.C. 2), are showing the well-known "Australia" machine. This machine, which has already been described in our pages, is being extensively used on housing schemes. On one large scheme, after tests extending over two months, the "Australia" machine has been adopted exclusively for concrete slab work. Houses built on a sea-wall in Australia some years ago with blocks made with this machine, although exposed to strong gales and to the salt-laden air, show no signs of depreciation. A feature of the machine is the speed with which blocks can be turned out; on one large housing scheme near London, plain blocks are being made at the rate of 430 per eight-hour day.

Messrs. Winget, Ltd., of 24E, Grosvenor-gardens, S.W.1, are showing their well-known plant for use in connection with concrete construction, viz., mixers and block-making machines for both hand and power, and also a stone-breaker and crusher and a tile-making machine. "Winget" machinery was extensively used for the construction of munition workers' homes during the war, including those at Crayford, the first garden city of concrete houses, we believe, to be erected in this country. Schemes where this plant is now in use include those at Sheffield (1,147 houses), Bournville, Chepstow, Brighton, and many other places. This exhibit was more fully described in our last issue.

LADDERS, BARROWS, &c.

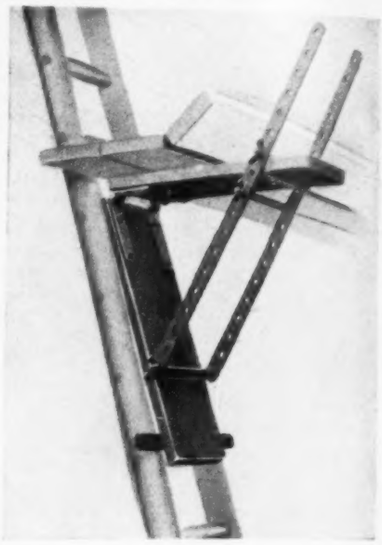
Besides a large variety of ladders and barrows of every description, the Acme Patent Ladder Co., of Earlsfield, S.W., is making a speciality of the "Guildhall" telescopic scaffold trestle. These trestles, which are made in various heights, are intended to replace ordinary scaffolding, thus effecting a saving in labour and obviating the necessity for cutting the face of a building. They consist of two trestles through which extension ladders are fixed in an upright position, and a plank is placed across the rungs of the central ladder at the desired height. Each trestle, therefore, stands on six legs which are connected horizontally 4 or 5 ft. from the ground, and the result is a very firm scaffolding. The whole can be very

"Acme" Trestle Scaffold.

compactly folded, and the central ladder may be detached from the trestles and used as an ordinary telescopic ladder. Forty-seven pairs of these trestles have recently been ordered by the Admiralty for use in airship building.

An extensive variety of builders' ladders, trestles, steps, trucks and other plant are shown by Messrs. Stephens & Carter, Ltd., of Green-street, Paddington Green, W. An interesting speciality is a wire-wove rubbish basket, the handles of which (made of wire covered with cane) are in one piece and run down the sides and across the bottom of the basket: there is no possibility, therefore, of the handles breaking away.

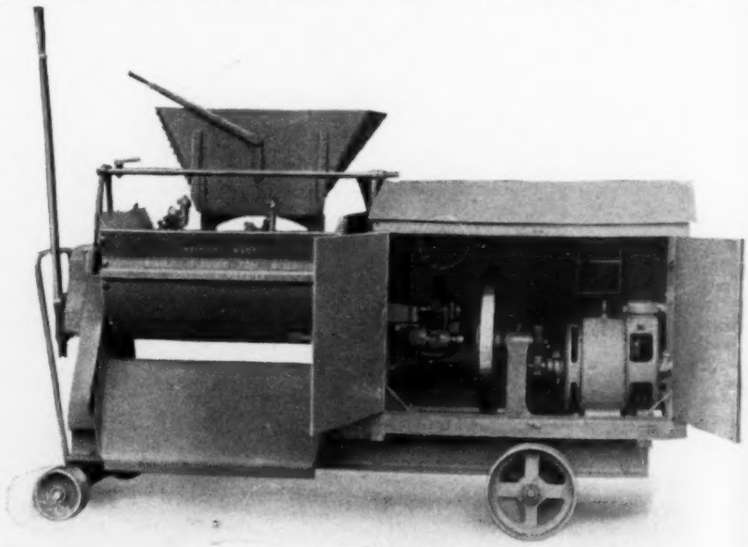
The ladder cripple shown by Messrs. Smith Bros., of 5, Black Lion Hill, Northampton, is



The "Smith" Ladder Cripple.

a useful device for securing a level platform for a plank at right angles to ladders. The apparatus is hooked on to the rungs of the ladder, and the hinged platform on which the plank rests is kept in position by an adjustable bar across two steel crosspieces in the form of a bracket. By altering the position of this bar the platform can be kept level whatever the angle of the ladder or the pitch of the roof on which the ladder is used. The apparatus is strongly made, and fits firmly on the ladder. When not in use it can be compactly folded up.

On the stand of Messrs. Drew, Clark & Co., of Diamond Ladder Works, Leyton, E., are shown a large variety of ladders for the use of builders and decorators, ladder towers, platform steps, patent staircase steps with two backs, barrows, trestles, fire escapes, &c. A feature of the stand are the "Gun Rung" ladders, which are made from straight-grained Norwegian poles and the spokes from gun-wheels which have been returned from war service. The steps for use on staircases



"Winget" Electrically Driven Chain-spade Mixer.

are provided with a twin back support which keeps the steps level when resting on the fourth step above that on which the longer support is resting. When not in use this shorter support folds compactly against a longer support, which may be used when the steps are required for a level surface.

ROOFING MATERIALS.

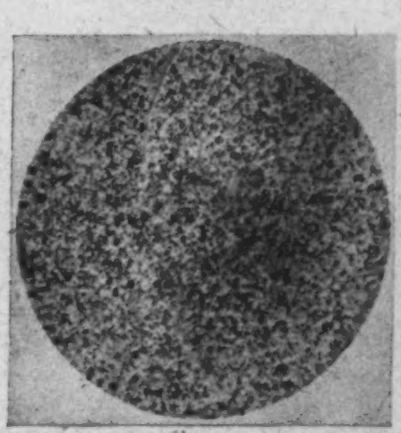
The exhibit of Messrs. D. Anderson & Son, Ltd., of Lagan Felt Works, Belfast, demonstrates the uses of the roofing felts, dampcourses and wood-preservatives manufactured by the firm. Models are shown illustrating the method of applying "Rok" self-finished bitumen roofing to a "Belfast" lattice girder roof, and the use of "Samador" and "Stoniflex" felt as sarking under slates. The merits of a bitumen dampcourse are demonstrated by a tank lined with bitumen sheeting and containing two sections of brickwork standing in water. Wood fencing treated with "Sideroleum" and "Ferro-Rok" corrugated sheets are also shown.

The Willesden Paper and Canvas Works, Willesden Junction, N.W. 10, are exhibiting paper and canvas heavily impregnated with a solution of cupro-ammonium, which actually gives the fabric more of the nature of a thin sheet of metal, and at the same time renders it waterproof, rot-proof and insect proof. The fabric thus treated has no odour, unpleasant or otherwise. On the stand the canvas and paper are well demonstrated, on one side as fixed on the front portion of a bungalow and on the other side as utilised in the waterproofing of roofs. Taking the bungalow side first, a portion of the roof is fixed up with the canvas, a very neat job; the other side is protected by four-ply paper fixed direct to the open rafters. It should be noted that the paper is obtainable one to eight ply in brown and green colours; generally speaking, however, the eight-ply paper is used only for very special work where large stresses have to be allowed for. The sides and ends of the bungalow are of four-ply paper. With regard to the roof sections opposite, one displays the use of a Willesden paper underlining on a boarded roof, while the other shows a paper underlining direct on the rafters and immediately beneath the slates or tiles. In either case the effect is to render the roof watertight—even if a tile or slate blows off the rain cannot penetrate the roof. The four-ply paper, particularly when painted, is quite suitable in a large number of instances to take the place of tin, sheet iron and other material. Much of the paper has been used in exposed positions for many years and is still good. A light green paper in one or two-ply is very useful for panelling work; it is also found that used for stencil plates it possesses many advantages over metal stencils. Where it can well be used in building work, Willesden paper works out very much cheaper than some other materials; it is made, with some exceptions, in rolls 5 ft. wide and of any length. The Willesden Company now has in hand a contract for the supply of 2½ million square feet of two-ply paper for use on the roofs and hutments on the North-west Frontier of India. In addition, very many important buildings have adopted the paper for underlining of roofs, while rather apart from such uses is that to which it is put (four-ply paper) in the manufacture of polo posts.

CEMENT.

The Concrete Utilities Bureau, of 35, Great St. Helen's, E.C., has an artistically-designed stand wherein information and literature on all matters relating to cement and concrete are given free. The stand is constructed of asbestos-cement sheeting with timber panelling; the outside of the sheeting is roughcast and the timber stained a dark brown, the whole giving a very pleasing idea of what can be done with this material.

On the stand of the Torbay and Dart Paint Co., Ltd., of 26-28, Billiter-street, E.C.3, are shown samples of cement stains and distemper. An interesting feature is a demonstration of two slides of photomicrographic views of surfaces of ordinary Portland cement, and of Portland cement treated with "Novoid" powder, which amalgamates with the cement and sets up a chemical action when in contact with water whereby the voids are filled with silicates and the material rendered weather and oil-proof. A proportion of the material mixed with concrete eliminates the necessity of cement rendering. Our illustrations show a portion of the surface of a plain Portland cement block enlarged 40 times by reflected light. This view shows the structure to be very porous, and even when the larger blowholes are eliminated the mass looks much like a sponge. The other view is of a block of Portland cement mixed with "Novoid," and the structure is very regular. The whole is a flat surface, very similar to granite. We understand it was in consequence of a suggestion by Mr. S. Thrower, of 20, Imperial-buildings, Ludgate-circus, E.C., that the merits of the material are shown in this manner.



Photomicrographic Views of Cement.

(TORBAY & DART PAINT CO.)

HEATING AND VENTILATING.

The London Warming and Ventilating Co. (20, Newman-street, S.W. 1) has on show a good range of domestic utility apparatus. There is, for instance, the "Florence" boiler grate, which, with an open fire, provides central heating for four other rooms besides that in which it is itself burning. It consumes anthracite coal at the rate of about one ton in two months or so. Another attraction is the "Kookajoie" anthracite cooking range, which burns a ton of anthracite in three months, the fire being always alight. Also there are 25 gallons of hot water practically always ready. Other advantages of this range are that its flues only require sweeping once a year, and the chimney once in fifteen years. No wonder it is called the "Kookajoie"! Then, again, there is the "Wifesjoie," a one-ring gas cooker, which, while saving gas, gives a constant hot-water service from a boiler of about 15 gallons. The stove's consumption of gas is a maximum of 40 cubic feet per hour; also it can be adapted to country houses where there are petrol-gas installations. Another anthracite burning stove is termed the "Home Comfort"; it will burn any other fuel, but anthracite is its proper food. It is of the radiator class of stove, but can be used if desired as an open grate by simply removing a mica door.

The "Devon" fire is the special line exhibited by Messrs. Candy & Co., Ltd. (Heathfield Station, S. Devon). The "Devon" fires are carried out in various tilings with a large range of designs which permits of choosing a fire to harmonise with any scheme of decoration. The fires are very economical in fuel consumption, their arrangement permitting the fuel to be consumed to its final ash. The essential parts being firebrick, these quickly become very hot and radiate heat. The tiles are carried out entirely in glazed work and the labour in cleaning is very small compared with the metal varieties of fireplace. Messrs. Candy & Co., we learn, are at present in the position of having more orders on hand than they can fulfil, in spite of having put in new plant to assist in coping with the demand.

Mr. Thomas Potterton (Cavendish Works, Ravenswood-road, S.W. 12) makes a speciality of apparatus for the provision of gas heated hot-water supply, whether for ordinary domestic purposes or for heating. Exhibited on the stand are a good number of these appliances. With the No. 50 "Victor" gas boiler with a capacity of 12 gallons it is possible to heat a bath (with gas at about 4s. 6d. per 1,000 cubic feet) at the cost of 2d. For this it will be seen that the difficulty which exists in so many houses, *i.e.*, that while gas cooking is the rule it is still necessary to light up the kitchen range to get the bath water hot—an unsatisfactory state of affairs, and in these days of coal difficulties oftimes a serious problem or at the least an expensive expedient. With the "Victor" gas-heated appliances the problem of the early morning bath, water for washing up and the like are overcome. Another possibility with the "Victor" apparatus will not be overlooked by those in charge of the larger-sized offices. How the "Victor" hot-water supply is applicable to such cases may be seen on the stand, where is a working example of automatic hot-water supply in combination with a system of low-pressure circulation with radiators. An important adjunct of this apparatus is a thermostat which automatically controls the gas consumption in order to maintain an equable temperature in the room heated. It may be mentioned that a circulation system of this kind has just been installed for the Automobile Association. We gather that in consequence of the firm having carried fair stocks of its gas boilers and similar apparatus, it is, in spite of a large influx of orders, able to fill requirements at comparatively short notice Other apparatus exhibited on the stand are sectional boilers for solid fuel and radiators for central heating, coke or anthracite boilers for domestic hot-water service, and the "Zigzag" special hot-water supply range boilers.

A number of new models of water boilers and cooking stoves are to be seen on the stand occupied by Hartley & Sugden, Ltd., of Halifax. Possibly, the most attractive of these is the "Heatanbake" boiler for domestic use. This apparatus ensures a regular supply of hot water both day and night, while at the same time heating the kitchen and doing the cooking. It is designed to burn broken gas coke, but a mixture of coal and coke, or any combustible household refuse, may be consumed. The boiler holds sufficient fuel to burn easily through the night and maintains the water at a high temperature sufficient for morning baths. The oven space measures 15½ × 16½ × 15½ ins., which is ample for a moderately-sized family—say, five or six. A combined boiler and oven is not always desirable, and to meet this case the "Beacon" domestic boiler has been produced. This is somewhat similar to the boiler section of the one described above. In both cases, the boilers are made of wrought steel with welded

joints, for which it is claimed that all danger of cracking is avoided. We were informed that one of these "Beacon" boilers has been in continuous operation for the last six months during the whole of which time it has given a continuous supply of hot water without trouble. Larger types of boilers are also to be seen on this stand, including the "Reliance" and "Municipal" models. Both are made of welded wrought steel, the former being of the sectional type and guaranteed for five years; and the latter designed to burn oil fuel as well as coke. To really appreciate these boilers, it is necessary to visit the stand, a course we would recommend anyone interested in this class of apparatus to follow.

The gas geyser for industrial housing purposes shown by Messrs. Ewart & Son, Ltd., of 346-360, Euston-road, London, N.W. 1, is so arranged that while the main part of the heater contains 15 gallons and requires about 25 minutes to heat sufficient water for a bath, a small subsidiary boiler is fitted, which will raise a gallon of water to practically boiling point in about five minutes. Thus the two distinct household demands for hot water—the bath-room supply and kitchen requirements—are met in the one heater. A special feature of the apparatus is that, even if left on continuously, it cannot be burnt out, as immediately the small reservoir is raised to boiling point, automatic circulation to the large one is set up. The heater may be fitted with a two-way cock with pipes running to two delivery points—say, a lavatory basin and bath respectively, in which case a considerable amount of expensive piping which would have to be employed in the ordinary way is done away with. Another inexpensive device shown is a hand basin fitted in the bath and held in position by a strong clip. The dirty water, after washing, is discharged into the bath, and runs off to the drain through a single main pipe. In addition to being cheap, this arrangement is advantageous where the bathroom is very small. It is, of course, only intended for small houses. In addition to the above, the firm are showing their well-known "Victor," "Lightning" and "Califont" geysers, a selection of bathroom fittings, enamelled baths, and so forth.

Messrs. R. Jenkins & Co., Ltd., of Rotherham, are showing, among other items, an improved type of hot-water supply boiler. This is known as the "Kalor," and is designed to stand in the kitchen alongside a gas or electric cooker—taking the place of the kitchen range. It is made of wrought welded steel and in six different sizes, having capacities of from 10-80 gallons at 150 degs. F. per hour. The fuel for which it is designed is either coke or anthracite. Particular attention has been directed to rendering the charging of the stove and removal of

The "Eco" Combination.

ashes and clinkers as clean a job as possible. For shaking the ashes into the pan a special arrangement is fitted, which is operated from the outside while the doors are shut. The doors are so designed that clinkers and even the live fire can be withdrawn with a minimum of dust. For use in conjunction with the "Kalor" boiler a special oven is made—the two combined known as the "Eco" combination. The hot flue gases from the boiler circulate round the oven, and frequently this is kept sufficiently hot for cooking purposes. Gas burners are, however, fitted as in an ordinary oven, the great economy being that the oven is always kept hot and no losses are entailed in burning gas purely to warm the oven.

PAINTS AND VARNISHES.

The stand of Messrs. Pinchin, Johnson & Co. (General-buildings, Aldwych, W.C. 2) is always a very striking one; the column and globe guarded by four lions reminds one somewhat of the Nelson Column in Trafalgar-square, though the colour schemes differ materially. Surrounding the central office are examples of the work which can be done with the paints, enamels, varnishes and so forth manufactured by the firm, particularly the "Minerva" paint, "Satinette" enamel, "Hygeia" flat finishes, and "Deydol" distemper. The panelling of the office demonstrates the effect which may be secured by the use of "Vertone" scrumble stains. There are many other exhibits disposed about the foot of the stand, these including iron paints, preservatives, lacquers, stains and everything else whose mission is to cover the nakedness of walls, woodwork, metal, etc.

The stand of Lewis Berger & Sons, Ltd. (Homerton, E. 9), is a practical exposition of what the average tradesman can do with the firm's special lines in paint, enamel and varnish. There are four specimen rooms displayed, in miniature, worked out in colour schemes. One of the rooms represents a colour scheme for a Jacobean dining-room, admirable in its way; while the white enamel and "Matone" railings of one of the inner rooms of the stand are all in keeping with the interior, which has a hand-stencilled frieze. Then there is the room which is a sort of half-way house to the Futurist style, a most striking colour scheme; and a drawing-room carried out in black with grey bottom panels and chrome-yellow upper panels, with a delicate mauve frieze to complete the picture. The outstanding feature is, of course, the yellow. This stand is well worth inspection, and both tradesman and layman can learn from what they see there.

SANITARY APPLIANCES.

One new item that is being shown on the stand of the Leeds Fireclay Co., Ltd., of 167, Strand, W.C. 2, is a patent lavatory tap, the working parts of which are concealed but readily accessible when necessary. All exposed parts are enamelled porcelain, and easily kept clean. One of the advantages of having the working parts concealed is that there is no chance of chipping the enamel when adjusting the taps, the water supply being regulated by pressing a knob at the side of the basin. Another recent product is the Johnson patent grease extractor, which it is claimed will completely extract all animal, vegetable and mineral fats, grease and oils from impure water. The feature of the extractor consists of an inlet pit in which the heavier solids contained in the waste sink water are deposited, the water and grease passing into a second chamber of suitable dimensions through an internal perforated hollow half ring running round the inside periphery of the vessel. This forms a constraining area inside the ring which ensures a steady flow of water, the surface of which is practically motionless. This allows the grease, &c., to rise to the top and the purified water is drawn off from the bottom of the chamber. For use in hotels and restaurants it is claimed to be ideal. A selection of jointless flooring composition is also displayed. Other items included in the display are "Lefco," "Greyco" and "Vitreous"—types of building materials suitable for smoky cities, porcelain, brickwork, drainpipes, cement and asphalts

A comprehensive range of high-class sanitary fittings displayed in five specimen bathrooms is to be seen on the stand occupied by Doulton & Co., Ltd., of Lambeth, London, S.E. 1. The exhibits are of very high finish, and are attractively displayed. The five bathrooms are decorated in various styles to suit all tastes, and it would be a difficult matter to decide which is the best. One of the rooms is marble-lined and similar to a number that were recently installed in a country mansion. In another the occupant of the bath has a selection of no less than seven ways in which he can spray himself with water, while, if he desires to, he can employ the whole lot at once. Some interesting new fittings are also shown, including valves and taps for baths, &c., finished in white porcelain enamel. These present a good appearance while necessitating very little work in cleaning. A patent silencer for use in conjunction with the ball valve of flushing cisterns is another new item which is certainly very effective in its operation. Contrasted with the ordinary type, which is also shown, it is practically noiseless, even though the water supply pressure is about 60 lbs. Drinking fountains for installation in factories and workshops are also shown, a special feature of which is the bubbling jet from which the water is drunk. This obviates the possibility of diseases being passed on from one person to another as the result of their drinking out of the same cup. In addition to the above are various patterns of lavatories, sinks, w.c.'s and toilet fittings, among which some high-class lavatories in grey, green and brown onyx marbles are especially noteworthy.

MACHINERY.

The Sturtevant Engineering Co., Ltd., of 147, Queen Victoria-street, E.C., demonstrate the marked tendency of late years to employ mechanical aids for the cleaning of large buildings, which has been vastly strengthened by the high cost of labour. The turbine vacuum cleaning plant of this firm is already installed in a large number of hotels, restaurants, clubs, cinemas, theatres, shops, &c., as well as in private houses. The plant is made in sizes to suit all classes of users. There is the small domestic portable cleaner, easily operated by one person, and large stationary plant which will accommodate sixteen or more operators at work at the same time. These stationary turbo exhausters are built in two types, vertical and horizontal, these being used according to the space at liberty, the size of the plant, and the conditions required. The turbo exhauster consists of a series of turbine wheels mounted on a shaft running on ball or self-lubricating bearings. The wheels are separated by suitable diffusing passages, built in such a way that the air is efficiently propelled from one wheel to the next, and so on right through the series, increasing the suction according to the number of wheels. By selecting a sufficient number of properly proportioned wheels these cleaners are made to suit any size or type of building. Sturtevant cleaners are in operation in all parts of the world.

The Phœnix Engineering Co., Ltd., of Chard, Somerset, have a comprehensive exhibit of pumps, tar sprayers and other apparatus so necessary for surveyors, local authorities and others who have to deal with road works. The "Floodgate" hand pump is shown in operation. The "Floodgate" lift pumps are very powerful, and are suitable for lifts up to 25 ft., and from 3,000 to 6,000 gallons of water per hour. As a matter of fact, although we refer to the pumping of water, they can raise almost anything, such as muddy or gritty water, sewage, &c. The pumps are supplied with or without carriage. Tar spraying machines of a number of sizes are supplied by the Company. In the vertical pattern they are made with capacities of 50, 80, 100 and 150 gallons, and in the horizontal patterns with capacities of 80, 160, 250 and 320 gallons. Horizontal machines can be arranged for side or end firing as desired. Tar spraying pumps can be supplied for fixing to customers' existing boilers. Pitch and tar boilers, again, are made in various sizes of from 10 to 500 gallons capacity. The large number of machines already mentioned by no means exhausts the apparatus which the Company manufactures

for road treatment, for they supply road sweepers, scrapers, tumbler carts, &c. Road making and preservation is a very important matter at the present day, and the plant exhibited at the stand of the Company attracted considerable attention.

On the stand of Messrs. Sutcliffe, Speakman & Co., Ltd. (Leigh, Lancs.), there is an "Emperor" press exhibited in operation. The press is particularly adapted for making lime-sand and similar bricks. It is made in three sizes, Nos. 0, 1, and 2, with eight to twelve moulds per table, and outputs varying from 1,000 to 2,000 bricks per hour. That on exhibition is the smallest size, No. 0. The press is designed to exercise great pressure on the material operated upon, and the makers claim for it that it is the only rotary press capable of pressing bricks equally from the top and bottom. The pressure may be regulated while the machine is in motion, and the feeding is automatic. It is a feature of the machine that the principal working parts are above the level of the table, thus avoiding the wear and tear which ensues through material falling into the bearings. The mould liners are made so that rapid and easy relining is possible, while each liner has two wearing faces. It should be remarked that the "Emperor" press is also largely used for making coal and coke briquettes. In operation it requires from 5 to 10 h.p.

A selection of wood working machines comprises the exhibits of Messrs. Perkin & Co., Ltd., of Junction Works, Whitehall-road, Leeds. These items include a range of fixed and rising top saw benches, a 24 in. improved type band sawing machine, a 12 in. surface planer; improved bench pattern 4 in. and 9 in. planing machine, and the "Victory" chain and hollow chisel mortising machine. The last named machine is suitable for a large range of mortising and equally useful for either joiners and builders or shipbuilding and carriage work. Each mortise head travels 11½ in., and will make a mortise up to 7 in. deep at one stroke. The table has a traverse movement of 5 in. and in a horizontal direction of 24 in. The chain mortiser is fitted with a device for immediately taking up any slack which may develop in the driving belt. Both chisel and chain are automatically returned to their original positions, after completing a mortise, by balance weights provided at each side of the machine. For blind mortising the chain slide is fitted with a depth gauge. The 4 in. high speed bench planer mentioned above has been especially designed for cabinet and furniture makers, and for light work of every description. It can be fitted on a bench, cabinet or pedestal quite handy to the operator, and will prove a convenient and economical small power tool for any woodworker.

A selection of up-to-date models of planing, mortising, shaping, sawing and such like woodworking machines is to be seen on the stand occupied by J. Sagar & Co., Ltd., of Canal Works, Halifax. The machines present a very workmanlike appearance, and are distinguished by their high finish. They have been fitted throughout with either ball or roller bearings, depending upon the purpose for which they are designed, but the resultant smoothness and ease in running are the same in either case. The semi-automatic chain cutter and hollow chisel mortising and boring machine is a typical example of the firm's production. The machine is suitable for general mortising in hard or soft woods and will take timber up to 11 in. deep by 6 in. wide. The main frame is a strong cored casting. The chain guide bar over which the chain runs and is guided determines by its dimensions the length and depth of the mortise, and the width of the chain fixes the width. The chain cutter is brought down to the work by a properly counterbalanced hand lever, which is adjustable for various sizes of timber. The speed of the machine is high, the chain making from 30,000 to 40,000 cuts per minute. The chips are consequently very small, and a small power is sufficient to operate the machine. A useful accessory that is supplied with the above is a small grinding machine for sharpening the teeth of the cutter.

TIMBER.

Two stands are occupied by the Young Firm, Ltd., of 1, 3 and 5, Virginia-road, Bethnal Green, and 103B, Holdenhurst-road, Bournemouth, both of which are entirely devoted to exhibits of various types of timber. A special feature has been made of plywood, and samples of every description are shown, including oak ply, birch ply, alder ply and Russian ash ply. The firm have specialised in square and round turnery, as well as twist work, and a comprehensive range of this class of their productions is shown. Some good examples of carved panels are also to be seen, the workmanship of which is certainly high class. An attractive and artistic finish has been given to the stands by the erection of fretwork arches over the entrances. Various types of wood have been used and the general effect produced is undoubtedly effective.

Messrs. James Latham, Ltd. (124, Curtain-road, E.C.2) have a large show of planks, boards and veneers, particularly various kinds of mahoganies and oaks. Of special interest are samples of English wainscot of fine quality, and architects, builders and others should find much of interest on the stand. For decorative effect some of the three-ply panels in figured woods should attract. Cabinet and picture frame makers and shop fitters will be interested to hear of the mouldings which are made by Lathams. The firm is now in a position to supply Beaver board either in large or small quantities.

GLUES.

The Improved Liquid Glues Co. (Great Hermitage-street and Bushell-street, E. 1) are the manufacturers of the "Croid" liquid glue. This is a special kind of glue, for which a large number of advantages are claimed; and in support of the claims the company is prepared to give demonstrations on its stand. "Croid" liquid glue has the advantage of being usable cold—all the trouble of heating up is abolished, with a consequent saving of time, trouble and expense. Also, without the repeated heating necessary with ordinary glue, the loss of strength thereby occasioned does not occur. Further it is claimed that by using the glue cold it does not become so brittle when set, and has greater holding power. "Croid" glue is delivered in sealed tins of handy size, and in consequence can be kept for any length of time in a perfectly good condition. Its makers claim for it that it is the strongest glue known and was used on the Vickers-Vimy-Rolls machine in which the first trans-Atlantic flight was made, and also on the England to Australia flight. Various grades of "Croid" are exhibited on the stand; and side by side with them a testing machine as used by the Government for testing the strength of glued joints. Another item of interest on the stand is the "Insol" waterproof and heatproof glue-cement, for sticking wood, metals, leather, rubber and other substances. It is claimed for "Insol"—and there is visible proof at the stand—that it is entirely unaffected by water and by normal heat. The visitor can himself pick out of water plywood which has been soaking for a long time, and he will find that it shows no sign of gaping. A further test shown is the placing of similar plywood in boiling water. "Insol," like "Croid," can be used cold. A third speciality is "Emero," a liquid glue specially prepared for affixing emery discs to grinding machines. Visitors will find of particular interest on this stand one of the balloonettes utilised by the British during the late war for the distribution of propaganda over the German lines. "Croid" glue was used in the manufacture of these balloons.

SAFES.

Established so long ago as 1795, John Tann, Ltd. (117, Newgate-street, E.C. 1), is a company which has gained a world-wide reputation for safes, strong-rooms and manufactures akin thereto. One of their particular specialities is the "Anchor Reliance" strong-room door for bullion rooms and plate rooms, and they are prepared to supply such doors in a number of grades, varying from the ordinary plate door to the heat-resisting door, which is made with a special view to resisting the efforts of up-to-date burglars who use a blow-pipe or explosive charge. A very neat piece of safe furniture is to be found on one side of the stand—a safe enclosed in a fine wood cabinet. Not only is this made so that it is unlikely to attract the attention of the illegitimate seeker after the contents of safes, but it is in itself a good-looking piece of furniture, such as might well come into the scheme of decoration of the best furnished houses. In addition to these are different varieties of the smaller-sized safes, constructed to meet special requirements. There are also steel chests, deed boxes, locks, strong-room shelving, fittings, ventilators, and so on.

GENERAL.

The Rawlplug Co., Ltd., of Lenthall-place, Gloucester-road, South Kensington, S.W., demonstrate the uses of "Rawlplugs," which we have described in a previous issue. "Rawlplugs" are patent fibre plugs used for fixing screws into plaster, brick, concrete, cement, marble, slate, stone, metal, &c. The plugs are adaptable for use by all the trades concerned with building. Wherever there is anything to be fixed, such as electric or gas fittings, wires, brackets, pictures, &c., these plugs are useful. They can be fixed so easily that the unskilled can use them without damaging the wall. The exhibit included specimens of work in all classes of materials, and demonstrations are made of the uses of "Rawlplugs," and the advantages to be gained by such use. A screw fixed in a "Rawlplug" in stock brick will withstand a direct pull of over half-a-ton. Demonstrations showing the strength of the plugs were made during the day.

The exhibits of Waygood-Otis, Ltd., of Falmouth-road, London, S.E. 1, include a passenger lift travelling from the ground floor to the gallery. The lift is operated by the firm's standard type of motor and winding engine, and is fitted with both car switch operation and with automatic push button control, with a special arrangement by which the control can be changed over from one system to the other. This dual system of control is advantageous in offices and other buildings where an attendant is in charge during the day only, as it enables the lift to be worked automatically after office hours. The car itself is of steel with glass panels, and is fitted with the firm's standard safety apparatus. Electric position indicators are fitted, one on each floor, to show the position of the lift in the shaft, and also direction indicators to show in which direction it is travelling. At each landing a button is fitted to call the attendant's attention, and this operates a light in an indicator in the car, showing which floor is calling. The light is automatically extinguished when the lift reaches the floor to which it is called. Altogether it is an excellent example of an up-to-date lift installation. Several models of various types of lifts are also exhibited, including the "Electroil." This is a platform lift, raised by a ram working in a cylinder. The motive power is oil pumped directly into the cylinder at high pressure by a patent variable speed pump operated by an electric motor. Power is only used on the upward journey, the oil being returned to the suction tank by the descent of the platform under its own weight. In addition, two models of hand-power service lifts are to be seen on the stand, one of which is worked by endless rope from either floor, the other being operated from the lower floor by handle. This latter type is fitted with an automatic foot-brake and is very quiet in working.

Two stands—one situated in the main hall and the other in the gallery—are occupied by

Tuke & Bell, Ltd., of 27, Lincoln's Inn-fields, London, W.C. 2. On the former a small sewage purification installation has been installed of a size suitable for country houses, or a pair or so of cottages, with a maximum of about eight persons in residence. The system, which is known as the semi-septic, may be said to consist of three different parts and to provide suitable accommodation for the carrying out of three distinct processes. The section through which the sewage water first passes is the liquefaction tank. This is of special formation, to encourage the liquefaction of the solid matter, to reduce the deposit of sludge at the bottom and to afford facility for the creation of a crust or scum at the surface of the liquid. The contents of this tank only need removing about three or four times a year. From this tank the sewage passes to the filter bed through a delivery pipe. The filters are usually made duplex, divided right across by an air space going down to the bottom of the bed, which gives access to the effluent channel and aeration to the bottom of the filtering media. Equal distribution over the filter bed is effected in the smaller installations by means of automatic double-acting tippers, which cause the liquid to flow into cast-iron serrated channels and so to all parts of the filter. The third portion of the installation is for the final disposal of the purified effluent. Any matter that may be washed through the filter settles in this compartment; the final effluent then passing to the discharge point. The installation is quite compact and unobtrusive in appearance. Among the items shown on the stand in the gallery are a domestic water-softening plant; an "Ideal" revolving distributor for filter beds, about 30 ft. in diameter; and a transport wagon fitted with the well-known "Constable" patent side for tipping trailers.

Concrete Aggregates.

The Concrete Institute has recently collected, in tabular form, a variety of useful information on the properties of aggregates available in different parts of the country. The collection of this information has been made possible by the co-operation of a number of county and borough engineers, who have furnished particulars upon forms provided by the Institute. By this means a large amount of valuable information has been made accessible to all who are interested in concrete work, and who wish to ascertain what aggregates are available in any particular district. The investigation is not yet completed, but the tabulated information at present collected is open for inspection, free of charge, on application to the Secretary of the Concrete Institute at Denison House, 296, Vauxhall Bridge-road, Westminster, S.W., from 11 a.m. to 12.30 p.m., and 2.30 p.m. to 4.30 p.m. (Saturdays 10.30 to 12.30).

Clerk of Works or "Prime-Cost Clerk"?

A discussion took place at a meeting of the Colchester Town Council last week with reference to the question of the appointment of a clerk of works for the new houses about to be erected in the borough. The Housing Committee recommended that instead of such an appointment the architects be instructed to employ a prime-cost clerk. An amendment was moved that a clerk of works be appointed, but this was opposed, the Mayor stating that none of the builders would go on with the work if a clerk of works were appointed to go into every detail. The builders would not put in any work of which they would be ashamed, but the difficulty of getting materials was very great, and they must take the best that could be obtained. The prime-cost clerk would be under the control of the architects, who would be supreme as far as instructing the builders was concerned. Supporters of the amendment urged that the architects could not be present at all the works, and a prime-cost clerk had no power of supervision or practical knowledge. The amendment was lost by a large majority, and it was decided to appoint a prime-cost clerk.

PROPOSED NATIONAL BUILDING CODE.—VII.

[Permission has been granted to the *Builder* by the National Federation of Building Trades' Employers to reprint the proposed National Building Code (which that body approved at a general meeting recently held in London) above the notes of a legal contributor. The previous articles appeared in our issues of February 13 and 27, March 12, 19 and 26, and April 9. These articles will be continued until the whole Code has been carefully considered. The various clauses of the Code itself will be inset in the columns, followed by the comments of our contributor, whose views, we would emphasise, are not necessarily our own.]

Schedule of Conditions (*continued.*)

Clause 28.

"If during the progress of the Works any suspension occur from any cause outside the Contractor's control, the Architect shall give instructions to the Contractor what covering up is necessary and to be executed for the proper protection of the Works, and the Contractor shall carry out such works as an authorised variation in accordance with Clause 32, and if such suspension shall involve the Contractor in any extra expenses in superintendence or management, or costs of material or labour, arising out of the delay caused by such suspension, such costs and expenses shall be included and allowed to the Contractor in the amount of such variation. If such suspension shall extend for a period longer than three calendar months the Contractor may at his option determine the Contract, and in such event the Works shall be measured up by the Quantity Surveyor and the Contractor shall be paid all amounts due in similar manner to that provided in Clause 30 hereof."

This clause makes a very far-reaching provision for which the only possible justification is the experience of certain contractors on the outbreak of war when work was suspended by order of Government departments or by reason of special circumstances brought about by the war. That the Federation wish that such a provision should become a permanent Clause in contracts under which the building of this country is to be done in the future, is indicative of the present unsettled state of Europe and of the building trade in this country, but it is doubtful whether such a pessimistic outlook is justified and whether the suspension which gives the contractor the option to determine the contract should not be very much more limited in its nature than it is by this Clause. It will be observed on reference to Clause 30, which will receive its measure of comment hereafter, that on such suspension a sum for profit on the work still uncompleted shall be paid to the Contractor. In regard to the cost of covering up as necessary for the protection of the works on a temporary suspension, this is an item which should, of course, follow the incidence of the risks of the suspension.

Clause 29.

"The Contractor shall complete the work by the day of , subject nevertheless to the provisions herein for extension of time in Clauses 27, 32 and 35 and elsewhere.

"Should the Employer enter into possession or occupation of the Works as before mentioned or at any other date agreed upon, the date of such possession or occupation shall be deemed to be the date of completion for all purposes under this Contract, and this provision shall apply to any section of the Works occupied before the general completion of the works, or occupied at any special date arranged for such completion. And the Contractor shall not be required by the Employer or the Architect to obtain any certificate from the Architect certifying the date of any such completion.

"If the Contractor fail to complete the Works by the date above mentioned, or by any revised date certified by the Architect under Clause 27, and the Architect shall certify in writing that the Works could reasonably have been completed by the said date, then the Contractor shall be liable to the Employer in the sum of £ sterling per month as liquidated and ascertained damages for every month beyond the said date during which the Works remain incomplete, and such damages may be deducted by the Employer from any moneys due to the Contractor; but the Contractor shall not be responsible under any circumstances for any consequential loss alleged to be due to such non-completion.

"If the Employer should fail to deliver the site by the date or dates set out herein or agreed upon between the parties, and/or should the Employer or his Architect prevent the Contractor from regularly proceeding with the works as set out in Clauses 1, 3 and 5, then the Employer shall be liable to the Contractor for damages arising out of such delay to the Contractor in accordance with the terms set out herein, together with any consequential loss arising from such delay, and any such sum shall be certified by the Architect and added to the Contract sum.

"Provided always that such damages to be paid by either party shall not exceed under any circumstances a sum equal to one-half of 1 per cent. of the total amount of the Contract for a calendar month."

This Clause provides one of the best examples of careless drafting that the document contains. In regard to the first paragraph, it is to be noted that neither Clause 32 nor 35 contain any provision for extension of time, while paragraph 2 is entirely superfluous having regard to the fact that practically the same definition of completion is contained in the Interpretation of Terms Clause.

Paragraph 3 is not only far from clear, but is wholly inconsistent by reason of making provision for liquidated damages, while at the same time stating that the contractor shall not be responsible under any circumstances for any consequential loss alleged to be due to such non-completion. A provision for liquidated damages has no other function but to provide for a loss which cannot be computed at the time the contract is entered into, and which therefore is fixed at the time of the contract to cover such loss as may be, or as is likely to be, suffered by the employer on failure by the Contractor to carry out the obligations in his contract. It is apparently not understood by the draftsman of this document what liquidated damages mean, or under what circumstances they will be enforced by the courts, while at the same time it should be pointed out that this paragraph makes provision for dealing with matters which already have been definitely provided for under sub-Clause (c) of Clause 27.

In paragraph 5, "the total amount of the contract," evidently meant "the total amount of the tender," as the amount of the contract may vary during the course of the work by reason of variations and additions; and "for a calendar month" is presumably to be read "for each calendar month's delay."

(*To be continued.*)

The Hendon Borough Surveyor.

Mr. S. Slater Grimley, M.Inst.C.E., is retiring from his office as engineer and surveyor to the Hendon Urban District Council, after nearly 40 years' service. During that time the population has increased five times and the rateable value about ten times, this district being very popular with the residential public, including, as it does, the Hampstead Garden Suburb and Mill Hill. Mr. Grimley is being retained as consulting engineer to the Council, and is succeeded by Mr. A. O. Knight, A.M.Inst.C.E., previously deputy engineer and surveyor.

MASS PRODUCTION OF COTTAGES.

PRE-CAST REINFORCED CONCRETE HOUSES ERECTED BY MACHINERY.

By "Anglo-Australian Resident Engineer."

Since my first article on pre-cast reinforced concrete houses erected by machinery appeared in the *Builder* last year, one Housing Committee, more venturesome than many others, has decided to have a sample pair of pre-cast crane-erected houses built. So satisfied was the Council with this rapid and economical method of building that it placed a contract with the builders for 100 similar houses. Several contracts for 500 houses each have since been given to the same firm by various housing committees for similar houses.

There is plenty of scope for the development of this method of construction, and an unlimited variety of very pretty houses may be constructed at a very low cost compared with hand-built brick houses. I know of a borough council which has recently placed a contract for a large number of pre-cast reinforced concrete houses to be built on the "Minniel" system at £602 per house; the same plans are to be used as supplied to the tenderers for brick cottages—the lowest price for which was £1,363. There are twelve different kinds of houses under this contract.

Standardising and pre-casting the component parts of houses and erecting large units by crane power is undoubtedly the most economical and rapid method of building construction; this system is as effective for houses as Ford's system is for building motor-cars, and with development will largely meet the requirements of Europe for houses. During 1915 and 1916 the writer was engaged upon a large public works contract in the East. The work comprised the formation of quays, roadways, wharf warehouses, reinforced concrete wharves, &c. Upwards of 14,000 concrete units, weighing anything between 10 tons and 20 tons each, were pre-cast at the rate of sixteen every nine hours and placed at the rate of twenty-seven every nine hours by native labour under European supervision. One brick at a time laid by hand and trowel labour cannot produce the necessary houses.

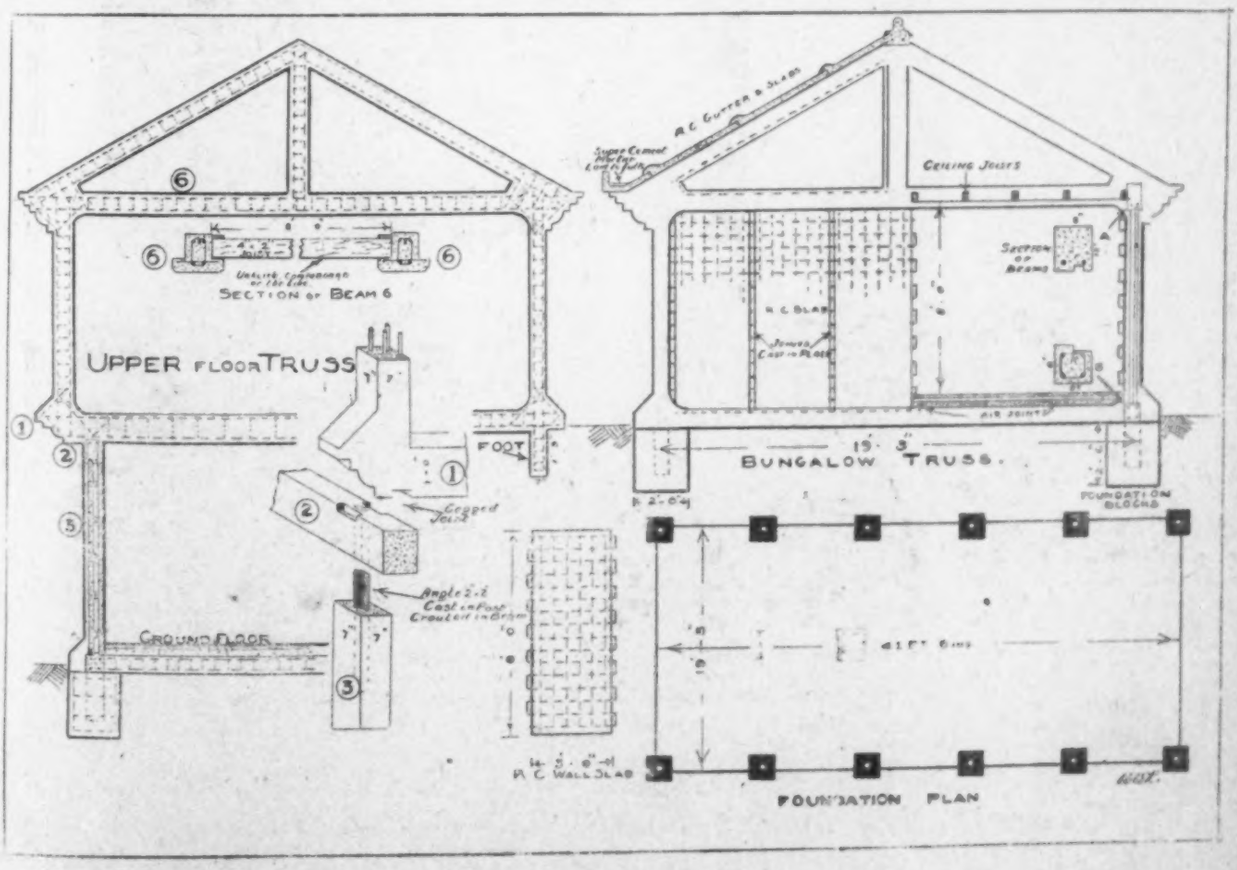
Artistic Concrete.—The future of concrete in architecture depends very properly upon appearance; the material has established itself unassailably for its structural value. The delight of the public in beauty of colour and texture is deeply cherished, and while plain concrete without particular attention to surface treatment is admirably adapted for massive effects and supplies a pleasing back-ground for vines, shrubberies and flower boxes, concrete must not suffer the limitations which this alone imposes. Concrete has been criticised for its lack of variety; this is not the appearance of concrete surfaces made possible by pre-casting with face exposed for surface treatment, much of which will be seen in the near future.

Concrete workers may have good sand, a variety of broken stone and vari-coloured marble chippings and beach shingle; but, if they bury all the beauty of the aggregates under an opaque film of cement, the hidden possibilities avail nothing at all. To expose the aggregate, the film of mortar that flushes to the surface in casting must be removed either by brushing the surface with a stiff brush, burlap or the like, or washing the surface with a weak solution of muriatic acid and water, which should be afterwards washed with water.

Rapid Construction.—The drawings herewith serve to illustrate a rapid and economical method of building with pre-cast reinforced concrete trusses and crane power. A method of building suitable houses and bungalows by the street or mile, which requires no skilled labour until after the roofs are covered in, and then very little, should appeal to all who are interested in the speedy production of houses in large numbers at a low cost. There are so many advantages in building by machinery and unskilled labour that it must supersede the slow, costly and indifferent old-time hand building for the bulk of the building required in reconstruction and housing. With this form of building there are no attendants; the usual allowance with old-time building is one labourer to each artisan.

Plastering.—With brickwork the plastering must be done vertically in two—and generally three—coats. There is also the cost of haulage and erection and removal of scaffolding to be charged to the job, with attendant delays and loss of time, a very serious item in these days. The materials are mixed by hand labour in small quantities, and 30 per cent. of the labourer's time is absorbed in walking to and fro with the materials for the plasterer who is spreading the stuff. In pre-casting the plastering can be done in a horizontal position, and in one coat instead of three, the whole being incorporated in one body whilst the slabs are in the casting frames, making a superior job. Very little skill is required, and no previous experience of plastering if an American long-handled trowel is used.

The ceiling of the ground floor is formed by the reinforced concrete flooring slabs of the first floor. The ceilings of the first floor are of asbestos-cement sheets, compo-board or the like. The tie-beams of trusses are cast with an off-set, and stock size sheets of these materials can be used without cutting or fitting if the trusses are suitably spaced. One man can lay the sheets in position on the off-sets as fast as they are handed up to him, and large sheets may be conveniently handled by two men. Ceiling joists, 4 in. by 2 in., are placed above the sheets and supported by the off-sets, and cut to fit tightly between the tie-beams. After the ceiling sheets are laid, binding battens of 3 in. by 1 in., two to each bay, should be nailed to the upper edges of the ceiling joist. The ceiling sheets are nailed to the joists, moulded or chamfered cover fillets being fixed at the joints.



TRUSSES.—Trusses, consisting of floor beam, front and back posts, tie-beam, rafters and king posts, are cast as single units. Six trusses form the frame of walls and roof of a bungalow with a frontage of 41 ft. 6 in., and can be erected in from two to three hours. The trusses for bungalows or one-floor houses are cast with legs 1 ft. 9 in. long extending below the floor beam.

FOUNDATION.—The foundation consists of twelve R.C. blocks, 2 ft. by 2 ft. by 2 ft. 6 in., with a sinking in each 1 ft. 9 in. deep, and in diameter ½ in. larger than the ledge of the posts. After the trusses are erected and stayed, the legs are grouted into the foundation blocks.

WALLS.—The walls are 6 in. in thickness, including a 2 in. cavity. The walls consist of an external slab of impervious concrete the full height from plinth beam to stringer beam, and fit into a rebate and groove. The slabs are reinforced with drawn-steel wire, which projects 1½ in. from the edges in the form of staples; the reinforcement from one member overlaps that of the adjacent member and is laced transversely with wire or hooping. The internal slabs are made of breeze, clinker or chalk concrete, 2 in. in thickness, the joints being cast *in situ*. The internal and external slabs are connected by nibs projecting 2 in. from the cavity side of external slabs, from which projects a galvanised-wire tie.

FLOORS.—The floors consist of pre-cast R.C. slabs with inverted nails cast in them for securing 3 in. by 1½ in. battens, which act as flooring joists, to which the boards are nailed as usual.

VENTILATION OF FLOORS.—The ground floor is ventilated by allowing a space of ½ in. between the edges of the R.C. flooring slabs.

HOUSES OF TWO STORIES.—Six trusses form the frame of walls and roof of a pair of cottages. The connection between the upper floor trusses and stringer beams consist of cogged joints grouted in with cement. The first truss erected is stayed with an iron or steel diagonal brace, the remainder of the trusses are linked to the first truss erected. The upper story or any part thereof may overhang the lower.

ROOFS.—The roofs are covered with reinforced concrete slabs 8 ft. by 3 ft. by 2 ft. 3 in., waterproofed with super-cement and coloured. The lower range of roofing slabs are cast with eaves, edge upturned to form a gutter, the bed of which is of super-cement laid to falls.

CHIMNEYS.—The chimneys consist of large blocks of concrete with earthenware pipes imbedded in them to form flues.

With good organisation, efficient management, portable concrete mixing machines and derrick cranes, as on our large public works contracts, the required houses can be produced by ex-Service men without any previous experience of old-time building methods; very few skilled men are needed.

The Height of Ceilings.

Mr. Munro (Secretary for Scotland) stated in Parliament last week that representations had been received from various local authorities asking for discretionary power to increase the height of ceilings in houses erected under the Housing Acts, and that the extra cost should be allowed to rank for the Government grant. The Government had carefully considered the point, and found that there was not sufficient reason to justify the great additional cost involved, either on hygienic or other grounds, and he could not, therefore, vary the Regulation.

Director of Production for Housing.

The Minister of Health has appointed Mr. Stephen Easten to act as Director of Production in the Housing Department of the Ministry. Mr. Easten will advise and assist the Ministry upon questions relating to the supply of labour and materials, and upon other matters designed to facilitate the erection of houses for which contracts have already been approved. Mr. Easten is Chairman of the National Federation of Building Trades' Employers, and of the North Centre Conciliation Board, and is a member of the Newcastle Corporation.

HOUSING AND TOWN-PLANNING NOTES.

WEEKLY HOUSING RETURN.

During the week ended March 27, tenders were submitted to the Ministry of Health for 4,635 houses. Tenders for 3,325 were approved, bringing the total number of houses in tenders submitted to 98,246 and in tenders approved to 88,326. By the end of February, the Valuation Department of the Inland Revenue had completed negotiations for the purchase of land on behalf of the local authorities in 2,610 cases, relative to an area of 13,707 acres. The price asked for this land, or to which local authorities had provisionally agreed, was £3,556,039, an average of £259 per acre. The total finally agreed to be paid was £2,553,608, an average of £186 per acre. The reduction effected was of £1,002,431, an average of £73 per acre. Details of local authorities' schemes dealt with during the week are as follows:—

Building Sites.

Schemes Submitted.—The number of schemes submitted was 101, bringing the total to 9,226 (61,750 acres). Larger schemes are as follows:—

URBAN.	ACRES.
Macclesfield	37.00
Bridlington	25.38
Lambeth	22.00
Ryton (2 sites)	10.22
RURAL.	**ACRES.**
Carmarthen (15 sites):	45.11
Scarborough (7)	21.01
Chester-le-Street	17.67
Devizes	11.55
Chipping Sodbury	10.00

Schemes Approved.—The number of schemes approved was 169, bringing the total to 5,378 (42,500 acres). Larger schemes newly-approved are as follows:—

URBAN.	ACRES.
Grays Thurrock	99.90
Scunthorpe and Frodingham ..	90.00
Hinckley	24.75
Brownhills	19.89
Wells	15.08
Havant	14.56
RURAL.	**ACRES.**
Chester-le-Street (2 sites).. ..	40.74
Hartley Wintney (3)	25.53
Morpeth	12.50
Campden	12.17
Barnet	11.25
Pewsey	10.33
Sedgefield	10.00

Lay-outs.

Schemes Submitted.—116 schemes were submitted by 62 local authorities, bringing the total to 3,356. New schemes are as follows:—

URBAN.—Adlington, Barnsley, Bedwas and Machen, Benfieldside, Bradford, Conway, Guiseley, Newport (I. of W.), Richmond, Smallthorne, Sowerby Bridge, Sutton Coldfield, Tamworth, Waltham Holy Cross, Wombwell, Worcester.

RURAL.—Auckland, Axminster, Blything, Braintree, Buckingham, Castle Donington, Castle Ward, Chapel-en-le-Frith, Chepstow, Chesterton, Church Stretton, Clutton, Culham, E. Westmorland, Eaton Bray, Ely, Escrick, Farnham, Glanford Brigg, Godstone, Lexden and Winstree, Llandaff and Dinas Powis, Lleyn, Loddon and Clavering, Midhurst, Newbury, Ogwen, Oswestry, Reigate, Ringwood, Rotherham, Sevenoaks, Shepton Mallet, Sibsey, Solihull, Spilsby, Stanstead, Tendring, Tenterden, Thakeham, Thedwastre, Watford, Wem, Westbourne. COUNTY COUNCILS.—Southampton, Surrey.

Schemes Approved.—The following 74 schemes were approved, bringing the total to 2,762:—

URBAN.—Adlington, Barrow-in-Furness, Felixstowe, Guiseley, Hanwell, Leiston-cum-Sizewell, Newton Abbot, Oadley, Padstow, Redcar, Scarborough, Smallthorne, Stretford, Sutton Coldfield, Tamworth, Tanfield, Waltham Holy Cross, Watchet, Wealdstone, Worcester.

RURAL.—Basford, Blaby, Blackburn, Blything, Bourne, Braintree, Buckingham, Castle Donington, Chapel-en-le-Frith, Chesterton, Church Streton, Culham, Eaton Bray, Escrick, Hayfield, Hoo, Loddon and Clavering, Newbury, Oswestry, Sibsey, Shepton Mallet, Solihull, Tendring, Uxbridge, Wem. COUNTY COUNCIL.—Southampton.

House Plans.

Schemes Submitted.—Schemes representing 4,006 houses were submitted. The total number of schemes submitted by local authorities now represents 168,358 houses. The new schemes are as follows:—

URBAN:—Batley, 179 houses; Bradford, 20; Brighouse, 16; Builth Wells, 24; Cheshunt, 14; Chorley, 53; Cleethorpes, 136; Felixstowe, 14; Gateshead, 202; Godmanchester, 8; Guiseley, 12; Hampton, 82; Highbridge, 20; Maidstone, 140; Midgley, 12; Newport (I. of W.), 66; Oldbury, 60; Raunds, 40; St. Ives, 50; St. Neots, 25; Smallthorne, 64; Standish-with-Langtree, 57; Stretford, 253; Sutton Coldfield, 30; Willington, 80; Wombwell, 61; Yiewsley.

RURAL.—Abingdon, 8 houses; Axbridge, 10; Barnet, 16; Beaminster, 6; Blything, 4; Bradfield, 22; Braintree, 20; Buckingham, 16; Cardigan, 24; Cerne, 6; Chepstow, 74; Chester, 36; Chesterton, 4; Chipping Sodbury, 10; Church Stretton, 38; Clutton, 40; Conway, 16; Cricklade and Wootton Bassett, 4; Devizes, 10; East Westmorland, 2; Eaton Bray, 20; Ely, 2; Epping, 10; Escrick, 6; Farnham, 32; Glanford Brigg, 16; Godstone, 16; Hayfield, 22; Hemsworth, 172; Henley, 4; Ketton, 62; Lichfield, 14; Lleyn, 44; Loddon and Clavering, 10; Marlborough, 4; Midhurst, 4; Newbury, 6; Ogwen, 10; Oswestry, 62; Pontefract, 1,156; Reigate, 16; Sevenoaks, 12; Stanstead, 26; Steyning East, 6; Tendring, 16; Tenterden, 74; Wem, 30; Westbourne, 6; West Lancashire, 8; Wokingham, 16; Yeovil, 12. COUNTY COUNCILS.—Southampton, 4; Surrey 24.

Schemes Approved.—Schemes representing 4,316 houses were approved. The total number of local authorities' schemes now approved represents 157,118 houses.

URBAN.—Barnsley, 76 houses; Barrow-in-Furness, 8; Batley, 179; Brighouse, 16; Builth Wells, 24; Cheshunt, 14; Cleethorpes, 136; Godmanchester, 8; Guiseley, 12; Hampton, 82; Hanwell, 131; Hessle, 54; Highbridge, 20; Leiston-cum-Sizewell, 136; Littlehampton, 66; Maidstone, 140; Midgley, 12; Northampton, 26; Northwich, 200; Oadby, 28; Oldbury, 60; Otley, 86; Raunds, 40; St. Ives, 50; St. Neots, 25; Smallthorne, 64; Stretford, 253; Sutton Coldfield, 30; Thornaby-on-Tees, 69; Turton, 56; Wombwell, 61.

RURAL.—Axbridge, 10 houses; Blything, 4; Braintree, 20; Buckingham, 14; Cerne, 6; Chester, 36; Chesterton, 4; Chipping Sodbury, 10; Church Stretton, 38; Cricklade and Wootton Bassett, 4; Culham, 4; Dartford, 110; Eaton Bray, 10; Epping, 12; Escrick, 6; Gloucester, 6; Hayfield, 22; Hemsworth, 172; Hollingbourne, 12; Hoo, 16; Ketton, 62; Lichfield, 14; Loddon and Clavering, 10; Marlborough, 6; Newbury, 8; Oswestry, 62; Pontefract, 1,156; Romford. 156; Tendring, 12; Tenterden, 62; Uxbridge, 32; Wallingford, 8; Wem, 30; Yeovil, 10. COUNTY COUNCILS.—Huntingdon, 4; Southampton, 4.

The Housing Subsidy.

The Scottish Board of Health has issued a pamphlet detailing the conditions under which the housing subsidy in Scotland is granted and the procedure to be followed by local authorities and others claiming the grant. The pamphlet (price 3d. net) is published at 125, George-street, Edinburgh.

THE BUILDING TRADE.

THE HEAT TRANSMISSION OF BUILDING MATERIALS.

This was the subject of an interesting bulletin issued recently by the University of Illinois. The object of the inquiry was to determine the co-efficients of heat transmission of standard building materials for exterior walls under conditions similar to those found in actual practice. Heat transmission tests previously made have generally been confined to small specimens, causing the data secured to prove unsatisfactory.

The co-efficients of heat transmission for a simple or compound wall or other part of a building, such as a floor or roof, can be computed if the surface co-efficients and co-efficients of conductivity are known for both still and moving air conditions for the materials used. These co-efficients should be determined on ful size walls, and for the temperature ranges usually encountered. An analysis of the process by which heat transmission takes place through an ordinary wall shows that heat passes through a wall by conduction, provided the temperature on one side of the wall is higher than that on the other. The co-efficient of conductivity varies with the material of the wall, and this co-efficient is practically constant for any given material in the wall for the ranges of temperature usually found in heated buildings, but is not so constant for higher temperatures.

Generally, the amount of heat transferred is independent of the actual temperatures of the two surfaces of the wall, and depends only upon the difference in temperature. Heat also affects the surface of a wall both by radiation and by convection, that is, from objects and from moving air, provided they are at a higher temperature than the surface of the wall.

The amount of heat transferred by convection or air movement depends upon (*a*) the form and arrangement of the surface, but is independent of the nature of the surface; (*b*) some power of the velocity of flow over the surface; and (*c*) the difference in temperature between the surface and the surrounding air. The difference in temperature between wall and air occurs within a very thin layer or film of air very close to the surface.

There are several methods employed for taking heat transmission tests.

The *ice-box* method has a metal box containing ice, the box being placed inside and touching the material to be tested. In this case the temperature of the melting ice and the outside temperature are known, and the factor of heat transmission is readily obtainable.

In the *oil-box* method, a metal box is covered with material to be tested. Oil is placed inside the box and kept at the desired temperature by an electric heater immersed in the oil. In this case, the range of temperature can be much greater than in the case of the ice box.

In the *cold air box* method, a jar of cracked ice is hung inside the testing box, the melting of the ice inside the jar maintaining a low temperature inside the box compared with the air temperature outside.

The test box for the *hot air box* method is made entirely of the material to be tested, and the heat is supplied by a resistance coil inside the walls.

The *flat or hot plate* method consists of an electric grid, which is made of resistance wire placed between asbestos sheets. The material to be tested is placed on both sides of the grid and in contact with it. Outside the test material are placed two hollow, flat plates kept at constant temperature by water circulation. When the water-cooled plates are used, only the conductivity can be determined, and without them the outside surface co-efficient may also be obtained. In neither case can the transmission co-efficient of air to air be obtained.

Full size specimens were used in the experiments, and the hot-air box method of testing was selected. In each case the box was built of the material to be tested, and in order to get good convection conditions the box was made of a height about that of an ordinary room, and in order that the air could circulate all round the box it was supported above the floor on small piers. (See Fig. 1.) The heating element inside the box was a resistance coil, helically wound with increasing pitch from bottom to top, resting on a wooden support. It was found that this produced a condition similar to that of an ordinary room, that is, the air was hotter towards the ceiling than at the floor line. A voltmeter across the terminals of the resistance heating coil, an ammeter in the line, and a water resistance box or rheostat to control the current, constituted the apparatus necessary to control and determine the heat put into the box, all electrical instruments being calibrated. Air and surface temperatures were measured with mercury thermometers and thermocouples, or with thermocouples alone. The thermometers were also carefully calibrated.

For the moving air tests a hood covering the test box was provided, with a 24 in. diameter duct, 31 ft. long, delivering air to the top of the hood (see Fig. 2). The air was forced through the air duct and over the box by means of a fan at the end of the air duct. A variable-speed direct-current motor provided the power for the fan, and varied the velocity of the air passing through the duct. A Pitot tube and a piezometer ring were used to determine the quantity of air discharged by the fan, and consequently the velocity of air over the surface of the test box below the hood. The mean velocity of the air in the duct being known, together with the relative areas of the duct and the space between the test column and the surrounding hood, the velocity of the air over the surface of the test box could readily be determined.

Tests were made of the heat transmission through the various walls, as given below, and the following co-efficients of heat transmission were obtained. In these cases C is the co-efficient for solid walls, the conductivity in B.T. units of 1 sq. ft. of wall surface per hour, per degree of difference between the inside and outside surface temperatures, per inch in thickness of the material tested; whilst for walls made of other than solid materials, the value of C is given for the actual thickness of the hollow walls tested. K is the surface co-efficient for still air conditions, and is in B.T.U. per square foot of surface per hour, per degree of difference between the surface temperature and the temperature of the air in contact with it.

Material No. 1 was a brick wall 3.79 in. thick, weighing 131.9 lb. per cub. ft. In this case, C = 4.00, and K = 1.40.

No. 2 was a wall of concrete having a 1 : 2 : 4 mixture, a thickness of 3.19 in., and a weight of 139.7 lb. per cub. ft. Here C = 8.30, and K = 1.30.

No. 3 was wood (fir) with one surface finished, the thickness being 1.06 in., and weight 33.37 lb. per cub. ft. In this test C = 1.00, and K = 1.40.

No. 4 was a test of cork-board, having a thickness of 2.03 in. and a weight per cub. ft. of 9.74 lb. Here C = 0.32, and K = 1.25.

No. 5 was magnesia board, having a thickness of 1.55 in., and a weight of 13.5 lb. per cub. ft. Here C = 0.50, and K = 1.45.

No. 6 was a single pane of glass in a wood frame, 91.4 per cent. of the test area being of glass, which had a thickness of 0.085 in. and weight of 141.1 lb. per cub. ft. In this case C = 2.06, and K = 2.00.

No. 7 was a wall of 2 in. tile, with ½ in. plaster on both surfaces, the thickness of tile being 2.02 in. and weight 119.9 lb. per cub. ft. Here C = 1.00, but in this case the value is for the full thickness and not per inch of thickness, and K = 1.10.

No. 8 was for 4 in. tile plastered ½ in. thick on both surfaces, the actual thickness being 3.84 in., and weight 127 lb. per cub. ft. Here C = 0.60, again for the full thickness, and K = 1.10.

No. 9 was for 6 in. tile plastered ½ in. thick on both sides, the actual thickness being 6.77 in., and weight 124.3 lb. per cub. ft. Here C = 0.47, again for the full thickness, and K = 1.10.

No. 10 was an asbestos board, 1 in. thick, and weighing 20.42 lb. per cub. ft. Here C = 0.50, and K = 1.60.

No. 11 was a wall composed of 60 sheets of asbestos, each $\frac{1}{64}$ in. thick, but the whole measuring 1.1 in. in thickness. The weight of the wall was 48.25 lb. per cub. ft. In this case C = 0.30, and K = 1.40.

No. 12 consisted of double glass with ½ in. air space between the sheets, the area of glass being 69.3 per cent. of the total area tested, and the glass weighing 141.1 lb. per cub. ft. Here C = 1.50, the value being for the total thickness and not for inch of thickness, and K = 2.00.

The moving air tests produced results quite different from the above results made under the still air conditions. Air moving over the outside of the walls causes the outside temperatures of the walls more nearly to approach those of the outside air, and the greater the velocity the

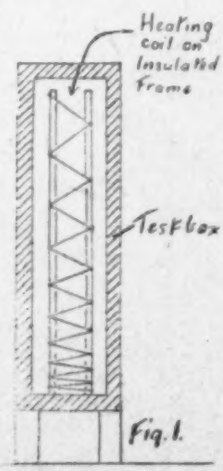


Fig. 1.

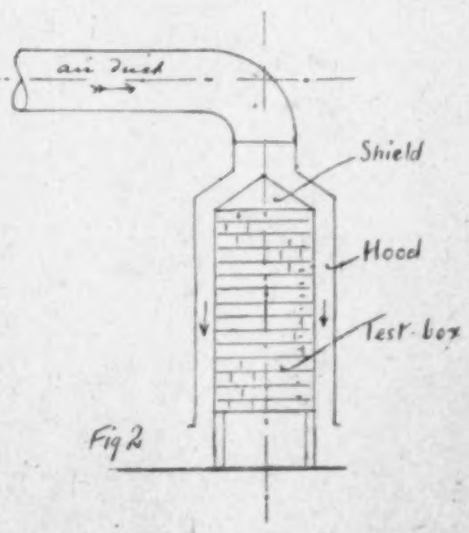


Fig 2

greater the approximation to the air temperature.

The effect of variations in the relative humidity of air on surface co-efficients was also tested, it being found that the increase in humidity has no appreciable effect on the outside surface co-efficient for brick, and although in the case of wood some increase is apparent, yet generally the effect is practically negligible.

The effect of air spaces on the transmission of heat through walls is of importance, the heat being transferred across an air space by means of heat transfer, radiation, convection and conduction. It is found that with a large drop in temperature between the two walls containing the air space the circulation of the air is more rapid, and the convection loss will be greater than with a smaller drop between the two walls. The effect of an air vacuum in the space is not appreciable until a very high vacuum is reached, a 29.96 in. vacuum having little effect on the loss by convection, which depends on the velocity of the circulation of the air, which again varies with the temperature difference of the two containing walls.

The radiation factor is not of great importance in air spaces for the lower temperature differences. But since the value is proportional to the fourth powers of the absolute temperatures of the two surfaces enclosing the air space, the radiation loss increases rapidly with the temperatures of the two surfaces, although the difference between these surfaces remains constant. In the case of the lower temperatures, an air space may thus be as effective as a heat insulator as a solid insulating material, but not at the higher temperatures, when a solid insulator is preferable. It is stated that air spaces greater than ¾ in. width give no additional value for heat insulating purposes.

MORTGAGES UNDER THE INCREASE OF RENT ACT.

A serious point was raised in the case *re* Dunn's Application (*Times*, March 12), regarding mortgages under the Increase of Rent and Mortgage Interest (War Restrictions) Act.

A trustee had invested certain trust funds in a mortgage on two freehold houses at Aldershot, one of which was within the Act and the other outside it. The trust property had to be distributed and, the trustee desiring to call in the mortgage debt, the point was raised whether under section 1 subs. (4) of the Act of 1915 he was precluded from doing so, as the interest was being paid, and the special grounds for relief in that subsection had no application. By section 2, subs. (4), the Act is made to apply "to every mortgage where the mortgaged property consists of or comprises one or more dwelling houses to which this Act applies," and the Court held that where the mortgage included a dwelling house to which the Act applied then the mortgagee was precluded from enforcing his security.

This is surely a point to be considered by the Legislature, for it amounts to this: that if a mortgage on dwelling houses (however many there may be and whatever their rent and rateable value) includes one dwelling house within the Act, then the security is unenforceable. We say a mortgage on dwelling houses advisedly, for there is a provision in section 2, subs. (4), where other land is included, for the subs. provides that the Act shall not apply "to any mortgage comprising one or more dwelling houses to which this Act applies and other land if the rateable value of such dwelling houses is less than one-tenth of the rateable value of the whole of the land comprised in the mortgage."

Many mortgages do not include other land, and although the bulk of the property mortgaged may be made up of houses of high rental and rateable value, one small house or cottage may well be included, and if that be the case the decision now given shows that the mortgage cannot be realised. There are many other points in this extraordinary legislation which cannot be realised!

RATES OF WAGES IN THE BUILDING TRADE.

The following are the present rates of wages in the Building Trade in the principal towns of England and Wales. It must be understood that, while every endeavour is made to ensure accuracy, we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons' Labourers.	Bricklayers' Labourers	Plasterers' Labourers.
Aberdare	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Accrington	1/9½	1/9½	1/9½	1/9½	1/11½	1/9½	1/9½		1/5½–1/6½	
Altrincham	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Ashton-under-Lyne	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Barnsley	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Barrow-in-Furness	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Barry	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Bath	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/5½	1/5½	1/5½
Bedford	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/3½	1/3½	1/3½
Birkenhead	2/–	2/–	2/–	2/–	2/–	2/–	2/–	1/4½	1/4½	1/4½
Birmingham	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Bishop Auckland	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/6½	1/6½	1/6½
Blackburn	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½		1/5½–1/6½	
Blackpool	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½		1/5½–1/6½	
Bolton	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Bournemouth	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/2½	1/2½	1/2½
Bradford	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Bridgwater	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/3½	1/3½	1/3½
Brighton	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Bristol	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Burnley	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½		1/5½–1/6½	
Burton-on-Trent	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½	1/6½	1/6½
Bury	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Cambridge	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Cardiff	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Chatham	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Chelmsford	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/3½	1/1½	1/1½	1/1½
Cheltenham	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Chester	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½		1/5½–1/6½	
Chesterfield	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½	1/6½	1/6½
Colchester	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Coventry	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Crewe	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½		1/3½–1/3½	
Darlington	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Derby	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½	1/6½	1/6½
Doncaster	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Dudley	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Durham	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
East Glam. and Mon. Valleys	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Exeter	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Folkestone	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Gloucester	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/7½	1/5½	1/5½	1/5½
Grantham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Grays	1/11½	1/11½	1/11½	1/11½	1/11½	2/–§	1/10½	1/8½	1/8½	1/8½
Grimsby	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Great Yarmouth	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Guildford	1/6½	1/6½	1/6½	1/6½	1/6½	1/7½	1/5½	1/3½	1/3½	1/3½
Halifax	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Harrogate	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Hartlepools	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Hastings	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Hereford	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/7½	1/5½	1/5½	1/5½
Huddersfield	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Hull	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Ipswich	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Lancaster	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½		1/5½–1/6½	
Leamington Spa	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
Leeds	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Leicester	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Lincoln	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Liverpool	2/–§	2/–§	2/–§	2/–§	2/–§	2/–§	2/–§	1/8½	1/8½	1/8½
Llanelly	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
London	1/11½§	1/11½§	1/11½§	1/11½§	—	2/0§	1/10½§	1/8½	1/8½§	1/8½
Loughborough	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½	1/6½	1/6½
Luton	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/7½	1/5½	1/5½	1/5½
Maidstone	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Manchester	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Mansfield	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½	1/6½	1/6½
Merthyr Tydfil	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Middlesbrough	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Newcastle-on-Tyne	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Newport, Mon.	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Northampton	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/8½§	1/6½	1/6½	1/6½
Norwich	1/7½	1/7½§	1/7½§	1/7½§	1/7½§	1/7½§	1/6½§	1/4½	1/4½	1/4½
Nottingham	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Oldham	1/11½	1/11½	1/11½	1/11	1/11½	1/11½	1/11½		1/7½–1/7½	
Oxford	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/4½	1/2½	1/2½	1/2½
Plymouth	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Pontypridd	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Portsmouth	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/2½§	1/2½§	1/2½§
Preston	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§		1/5½–1/6½	
Reading	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½§	1/6½§	1/6½§
Rochdale	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Rochester	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/3½	1/3½	1/3½
Rugby	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/8½§	1/6½§	1/6½§	1/7½
St. Albans	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/3½§	1/3½§	1/3½§
St. Helen's	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Scarborough	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/6½§	1/6½§	1/6½§
Sheffield	1/11½	1/11½	1/11½	1/11½	1/9½§	2/–§	1/8½	1/8½	1/8½	1/8½
Shrewsbury	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/8½§	1/6½§	1/5½§	1/6½§
Southampton	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/2½§	1/2½§	1/2½§
Southend-on-Sea	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½§	1/5½§	1/5½§	1/5½§
Southport	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§		1/5½–1/6½	
South Shields	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Stockport	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Stockton-on-Tees	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Stoke-on-Trent	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/5½	1/5½	1/5½
Stroud	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/7½§	1/5½	1/5½	1/5½
Sunderland	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Swansea	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/6½	1/6½	1/6½
Taunton	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/6½	1/5½	1/5½	1/5½
Torquay	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/4½	1/4½	1/4½
Wakefield	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/8½	1/8½	1/8½
Walsall	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/8½§	1/6½§	1/6½§	1/6½§
Warrington	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
West Bromwich	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/10½	1/8½	1/8½	1/8½
Wigan	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½		1/7½–1/7½	
Windsor	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½	1/6½	1/6½	1/6½
Wolverhampton	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/8½§	1/6½§	1/6½§	1/6½§
Worcester	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/4½	1/4½	1/4½
York	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/9½§	1/6½§	1/6½§	1/6½§

The Masons' rate given is for bankers: fixers usually ½d. per hour extra. * War bonus of 3s. per week granted † War bonus of 3s. per week granted. ‡ War bonus of 3s. 6d. per week granted. ‡‡ War bonus of 5s. per week granted. ¶ War bonus of 7s. 6d. per week granted. § These rates include the 12½ per cent. bonus. [The above rates, unless otherwise shown, are exclusive of 12½ per cent. bonus.—Ed.]

LAW REPORTS.

Workmen's Compensation: The Need for Amendment.

In our issue for May 23, 1919, we commented upon two decisions under the Workmen's Compensation Act, viz., Bell *v.* Armstong, Whitworth & Co. and Redfern *v.* Armstrong, Whitworth & Co. The two accidents happened to employees employed on quite different works of the employers, but in both cases the accidents happened in meal times. In both cases, also, the firm had supplied a dining-hall or canteen to which employees could, if they so desired, resort to take their meals, and in each case to reach the dining-hall the works had to be left and a section of the street had to be traversed. In the first case, a woman going to the canteen was knocked down and killed in crossing the street; but in the second case the woman, having finished her meal, was going down the stairs of the premises in which the dining-hall was situated on her way to return to work when she slipped and broke her ankle. The woman in the first case was held by the Court of Appeal not to have met with the accident "arising out of and in the course of her employment," but in the second case the Court of Appeal held that the accident had arisen "out of and in the course of the employment." This latter case has been carried to the House of Lords, and the judgment of the Court of Appeal has been affirmed by a majority of three to two.

We pointed out that the two decisions taken together showed that the Act as administered worked inequitably to employees, for there was no principle upon which compensation could be withheld in the first case and awarded in the second. Lord Finlay and Lord Dunedin, who were in the minority in the House of Lords, would have placed the two cases on the same footing, that is to say, as the employee was not on the premises in question to perform any part of her duty to her employers they would have treated her, as was the applicant in Bell's case, as having met with an accident not "arising out of and in the course of her employment," and such a finding would have applied to the two cases a principle that could easily be understood and applied in other cases. But the majority held that as at the time of the accident the woman was actually proceeding to her work and was upon the employer's premises, she was within the Act. Lord Wrenbury, however, although joining in this opinion, is reported as having said that he had long since abandoned the hope of deciding any case upon the words "arising out of and in the course of the employment" upon grounds satisfactory to himself or convincing to others. The two decisions, therefore, remain as illustrating the glaring inequalities of the Act, which calls for amendment.

Lord Wrenbury referred to the steps being "very slippery," but, of course, this fact had nothing to do with his judgment, as neither locality nor negligence enter into the Workmen's Compensation Act. The accident has to occur "out of and in the course of the employment," and if a man happens to be on his employers' premises and meets with an accident from some defect in the premises, he may have his remedy at common law, although under the circumstances he is outside the Compensation Act. Similarly he may be miles away from the employers' premises and yet be entitled to compensation if he meets with an accident when performing his duty to the employer.

A clear definition of what is intended by "out of and in the course of the employment" is needed, and some other form of words should be introduced into the Act. If the view of the minority in this case had prevailed, some principle would have been provided upon which arbitrators could act and direct themselves, but as it is the distinction between these two cases offers no principle, and each case will be decided with the same difference of opinion in the arbitrators as was expressed by the Law Lords on this Appeal, the majority of whom supported the decision of the arbitrator on the ground that there was evidence to support it. The question seems capable of solution if the guiding fact to be considered is simply whether the workman is within the scope of his employment and furthering his employer's interests or performing some duty for him. These two women were practically in identical positions as regards the employer's work, yet the fact that one of them happened to be on premises in the control of the employers: although that fact is not essential to the test applied by the Act, has led to one being taken and the other left.

Breach of Contract.

An award has been made in favour of Messrs. Chandler Bros., road contractors, of Manchester, against the Welsh Garden Cities, Ltd., of Cardiff, in the arbitration heard at the Surveyors' Institution, Westminster, in December last, by Major Harry Barnes, M.P., F.R.I.B.A., F.S.I. The arbitration arose out of differences in respect to a contract for carrying out certain work at Stocksbridge, near Sheffield, and the arbitrator has awarded Messrs. Chandler Bros. £2,149 19s. 9d. in settlement of their claim, or, alternatively, for £1,999 19s. 9d. in the event of a legal point in which he has decided in their favour being held to be wrongly so decided.

The case for the claimants showed that in 1917 Messrs. S. Fox were erecting 280 to 300 cottages for their workmen at Stocksbridge, near Sheffield, and entered into a contract with the Welsh Garden Cities, Ltd., to carry out this work. Respondents sub-let the contract for building the cottages to Messrs. Jones & Co., of Cardiff, and Messrs. Chandler, of Manchester, were brought in to carry out certain excavation work for road making. This work proceeded satisfactorily, and in October, 1917, a contract was entered into for metalling, curbing, and channelling the roads. In the contract it was agreed that the respondents should provide a crusher to crush the road material, that they should deliver slag for the roads by the side of the crusher, and that the slag and crushed material should be carried by winch and trucks provided by respondents to the various roads. Claimants' case was that it was the neglect to provide these things that the differences resulting in the arbitration had arisen.

In his award the arbitrator found that the claimants completed the major portion of the work in a workmanlike manner, and that the respondents broke the contract and prevented the claimants completing the work by failing to provide and fix the stone crusher and deliver the slag as provided by the contract.; by instructing another contractor to undertake a portion of the work which claimants had contracted to perform; and by failing to afford claimants facilities to proceed with the work. He found that claimants were justified in leaving the work.

New Capital Issue.

The Fireproof Wood (Oxylene) Manufacturing Co., Ltd., invites subscriptions for an issue of 50,000 £1 shares at par; the total issue is for 100,000 shares, of which 50,000 are being taken up by the directors. The company has been formed principally for the purpose of acquiring from the Timber Fireproofing Co., Ltd. (which is the parent company) the right to have wood treated by that company's "Oxylene" process of fireproofing. The company will, in addition to undertaking the construction and fitting of fireproof wooden houses and buildings, manufacture and supply fireproofed building timber, joinery work, and wooden fitments. The company has agreed to purchase from the Timber Fireproofing Co., Ltd., about 2 acres of freehold land at Market Bosworth, at the price of £600, upon which land the company proposes to erect works equipped with up-to-date joinery and woodworking machinery. The directors have secured the services of Mr. A. C. Hunt as Technical Adviser and Manager; Mr. Hunt was for many years the architect to Cadbury Bros., Ltd., of Bournville. The subscription list closes on April 20.

PATENTS.

APPLICATIONS PUBLISHED.*

139,011.—J. C. de Jong: Greenhouses and horticultural frames.

139,016.—W. Gallagher and J. Crompton: Boiler and like furnaces.

139,046.—T. R. McDowall: Glazing bars.

139,071.—H. Morris, Ltd., W. H. Purnell and J. A. Butterworth: Portable jib cranes.

139,075.—J. C. Ambrose and C. B. Mathews: Blocks for encasing flanged girders.

139,083.—J. W. Brockman, H. Greaves and H. S. Parker: Tanks and cisterns.

139,105.—G. Erne: Door-locks.

139,112.—W. J. Bennett: Tiles, blocks, and similar objects for covering walls and floors.

139, 118.—H. Hodges: Ladders.

117,605.—F. Hartner: Process for the manufacture of a mortar forming material from anhydrite.

139,262.—E. A. Smith and A. Gaunt: Sash-line securing devices for sliding windows.

139,267.—A. C. Ionides: Heat treatment of bricks and pottery.

139,294.—T. E. Hardy: Stanchions and beams for use in the construction of hollow-walled buildings.

139,314.—F. E. Walker and J. R. Betts: Method of and apparatus for lining pit shafts, underground roadways, tunnels, arches, &c.

139,352.—W. G. Clark and C. H. Brough: Safety grip for control rope of lifts.

139,360.—E. G. Hinkins: Tool handles.

* All these applications are now in the stage in which opposition to the grant of Patents upon them may be made.

TRADE NEWS.

The old-established business of Geo. Munday & Sons, which has been carried on by Mr. H. G. Searle since October, 1917, has been converted into a private limited company. Mr. Searle will continue as managing director, associated on the board with Mr. G. L. Nash and Mr. J. A. Brown, both of whom have been with the firm for many years; Mr. J. R. Hickman has also been invited to join them.

Messrs. Young & Marten, Ltd., of Caledonian Works, Stratford, E., inform us that they are now in a position to give quick delivery of leaded lights and stained glass.

The Supply of Timber.

In reply to a question in the House of Commons last week, Mr. Bridgeman, on behalf of the Board of Trade, said that all stocks of timber held by the Government were disposed of to merchants. Control of the trade having been relinquished as from March 31, 1919, the Board of Trade had no power to control the price.

The Gattie Transport System.

The New Transport Co., Ltd., has issued a pamphlet giving the Report of the Departmental Committee which investigated Mr. W. A. Gattie's proposals for improving the method of handling goods and traffic, together with an "analytical reply" thereto by the Company. In a foreword, the Company submits that the reply shows that "the Committee's Report is against the weight of evidence, and that it should not be accepted." The pamphlet is to be presented to Parliament.

Archangel Timber.

In reply to a question in the House of Commons last week, Mr. Bridgeman (Parliamentary Secretary to the Board of Trade) said that during the season 1919 no timber from Archangel or the White Sea area was sold by the Government before it was shipped. For the season 1920 no timber had yet been shipped as the ports did not open until June. Negotiations were now proceeding with a view of disposing of the whole of the Government's holding for shipment during 1920.

PROPOSED NEW BUILDINGS AND OTHER WORKS.*

In these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works, at the time of publication, have been actually commenced. Abbreviations.—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

BATH.—Plans approved: Alterations, 7, Stall-street; flats, 19, Park-street; sheds, Cat-lane; garages, Newbridge-road; w.c., Richmond-grove; extension of shop, 49, Southgate-street; workshop, Northampton-buildings; dwelling house, Newbridge-road; shop rear of 49, Moorland-road, and alterations to shop front, 49–51, Moorland-road; bathroom, &c., 38, New King-street; alteration and widening of side entrance, 94, Holloway; offices for Messrs. Pitman & Sons, Ltd., Lower Bristol-road; alterations, Windsor Castle Hotel, Weston; alterations, The White Horse Inn, Twerton; bungalow at Newbridge-road.

BOURNEMOUTH.—Plans approved by T.C.: Swimming bath, "Wychwood School, Braidley-road, for Major F. B. Insley; alterations and additions, 45, Southbourne-grove, for Mr. W. Lockyer; alterations and additions, "East Cliff Cottage," Grove-road, for Mrs. Mavor; four shops and eight flats, Seabourne-road, for Mr. F. W. Mills; additions to premises Christchurch-road, for Messrs. T. & H. Hunt; alterations and additions, Talbot-avenue, for Mr. Archibald; conservatory, "Montrose," Portman Crescent, for Mr. F. W. Riley; additions, "Alma Hygienic Laundry," Alma-road, for Mrs. Hunt; alterations and additions, "Grosvenor Garage" Poole-hill, for the Grosvenor Garage (Bournemouth), Ltd.; store rear of 129, Alma-road, for Mr. A. Lockyer; additions to house and motor house, Montague-road, for Messrs. H. B. & E. Mudge; house, Stirling-road, for Mr. J. J. Elkins; alterations to existing building, Tuckton-road, for the X.L. Bakeries Co., Ltd.; additions, "Reliance Laundry" Paisley-road, for Mr. J. Neale; additions, 88, Poole-road, for Mr. J. Sharp; motor house, 8, Hayes-avenue, for Mr. C. Trent; four houses, Seaward-avenue for Messrs. Lawrence; house, Newstead-road, for Capt. E. Jenson; two houses, Newstead-road, for Mr. C. J. Drewitt; house Berkeley-road, for Mr. W. H. Stewart; house, Seaward-avenue, for Messrs. Lawrence; house and garage, St. Catherine's-road, for Mr. A. B. Tugwell; two houses Wynyard-road, for Mr. W. W. Baker; Bakehouse, Kimberley-road, for Mr. C. Coates; house, Malvern-road, for Mr J. Francis; three houses, Gresham-road, for Mr. W. Hayward; shop front, Alma-road, for Mr. H. W. Lovell; house, Malvern-road, for Mr. J. Francis; two houses, Greenroad, for Mr. A. J. H. Adams; two houses, Howard-road, for Messrs. Rumsby & Rodd; house, Frederica-road, for Mr. W. G. Ballard; bungalow, Seaward-avenue, for Mr. H. G. Mills; additions to premises, 41, Seamoor-road, for Mr. Kingsnorth; motor garage, 133, Holdenhurst-road, for Mr. D. G. Jenkins; house Soberton-road, for Mr. W. Hayward; house, Iddesleigh-road, for Mr. J. A. Neathercoate; house, Queen Mary-avenue for Mr. S. Way; two houses, Charminster-avenue, for Messrs. C. A. Barnes & Co.; conversion into two flats, "Redvers." Branksome Wood-road, for Miss Heathcote; extension of workshops, 18, Somerset-road, for Mr. G. Scott; house, Darracott-road, for Messrs. C. Day & Sons; house, Markham-road, for Mr. H. M. Elford; house, Firs Glen-road, for Messrs. G. & F. G. Sparks; semi-bungalow, Stirling-road, for Miss Grigson; house, Stirling-road, for Mr. J. J. Elkins; 3 bungalows, Firs Glen-road, for Mr. H. Moores; two bungalows Cecil-avenue, for Messrs. Chandler & Rumsby; transformer sub-station, Abbott-road, for the Bournemouth & Poole Electricity Supply Co., Ltd.; flats, Grange-road, for Miss MacMillan; house, Nairn-road, for Mrs. A. Jensen; conversion into three flats, "Belmont," Parsonage-road, for Miss A. L. Smith; conversion of stables into dwelling house "Belmont," Parsonage-road, for Miss A. L. Smith.

BURNHAM-ON-CROUCH.—Plans passed by U.D.C.: bungalow, Mildmay-road, for Mr. L. Duplantier; additions to cottage at Ostend, for Mr. R. Leslie.

CARNARVON.—Plans passed: Alterations, Old Union Iron Works, St. Helen's-road, for Messrs. Lake & Co.

CASTLE WARD.—Plans have been approved by the R.D.C. for the erection of houses on a new building estate called the Bridge Park Estate, which is situated at the west side of the North-road near the Three Mile Bridge, Gosforth. The estate comprises eight acres, and a scheme has been promoted by a number of Newcastle gentlemen who have had considerable experience in house matters. Mr. David A. Larmour, house and estate agent, is secretary of the company, and the architect is Mr. S. H. Lawson, Emerson Chambers, Newcastle.

CHELTENHAM.—Plans passed: Cheltenham E.C., manual instruction room, housewifery room and lavatory, Gloucester-road Schools; W. H. Cole & Co., Ltd., hairpin factory, Russell-place; Gloucestershire Aircraft Co., foundry, Sunningend Works; United Chemists Association, Ltd., building, Ucal Works, Priory Court, High-street; Cheltenham College Council, building, Paragon-terrace, Bath-road; Lieut. H. G. Wright, garage, corner of Gloucester and Granley-roads; F. F. Leaver, motor house at Lisnamoe, Lansdown-road; W. J. Cock, cowshed, Fiddlers Green Farm; Waite & Son, office addition, 349, High-street.

DARFIELD.—Earl Fitzwilliam of Wentworth House, near Sheffield, has launched a big housing scheme for Darfield village. He has presented land to the local council for the erection thereon of 600 working dwellings and 400 modern villas. The scheme will be developed on garden village lines.

DOVER.—The Corporation having applied for sanction to a loan of £7,000 for extending the headings at the Waterworks, a local enquiry has been held by an inspector of the Ministry of Health. There was no opposition to the proposal.

DUDLEY.—Plans passed by T.C.: Mr. S. A. Webb, sanitary conveniences, &c., 29, Porter-street Dudley; Mr. A. Harley, motor garage, 36, Vicar-street, Dudley; Messrs. Johnson & Baldock, two dwelling houses, Blackacre-road, Dudley; Messrs. the Shropshire Worcestershire and Staffordshire Electric Co., workshop, Bull-street, Dudley; Mr. G. Moore, alterations to Temperance Institute, High-street, Dudley; Mr. C. H. Maurice, new shop front, 185, High-street, Dudley; the Dudley Corporation Housing Committee, six houses, Red-hill, Dudley; 100 dwelling houses, Blower's-green, Dudley; The Dudley Corporation Housing Committee, 30 dwelling houses, Walford-street, Dudley; Messrs. A. Preedy & Sons, subway, 85, High-street, Dudley; Mr. H. W. Field, outbuildings, 299, Stourbridge-road, Dudley; Mr Simeon Jewkes, alterations to property, Trinity-road, Dudley; Mr. H. Smith, additions to house, Hill-street, Netherton, Dudley; Messrs. J. Chilton & Co., extension to motor garage, Wellington-road, Dudley; Mr. T. Butler, motor garage, Cradley-road, Netherton, Dudley; Messrs. Appleton & Co., Ltd., factory and offices, 28, Porter-street, Dudley; Messrs. T. W. Adshead & Sons, Ltd., extension to works, Vauxhall-street, Dudley; Messrs. J. Hanson & Sons, cart shedding and office The Inhedge; Messrs. Builder & Son, alterations to warehouse, King-street.

DURHAM.—It was reported at the last meeting of the R.D.C. that Messrs. Bell Bros., colliery owners proposed to erect 50 houses at Tursdale. The plans were passed.

ESSEX.—The Small Holdings Committee recommend the erection of cottages at the following places: Sturricks Farm, Great Bentley, four cottages; Enfield Farm, Boxted 1 cottage; Grays Mill Land, Kelvedon, 1 cottage, land at Pods Wood, Messing, 2 cottages; Little Warley Hall Farm, 1 cottage; Rookes Farm Berden, 1 cottage; Maylands Green Farm, Hornchurch, 4 cottages; Beaumont Estate, 21 cottages; Park and Marshy Farm, Gt. Yeldham, 1 cottage.

FOLESHILL.—At the last meeting of the R.D.C. the Surveyor submitted plans for 95 houses, 84 of which are to be erected on the Copsewood estate, Stoke, and said that 92 of the houses approved were from persons entitled to receive the Ministry of Health subsidy.

GRANGE.—On behalf of the Ministry of Health, Major G. Stewart has held an inquiry relative to the application of the U.D.C. to borrow £1,000 for the purpose of constructing a small lower promenade.

HEXHAM.—Plans passed by R.D.C.: Institute, Town Head, Arcomb, for Mrs. Henderson; bungalow, Lowgate, for Mr. Bland; villa, Stokesfield, for Mr. W. F. Askew; semi-detached villa, Corbridge, for Mr. Charlton.

HULL.—Plans approved: Mr. C. T. Simmonite, two houses, Summergangs-road; Mr. W. Robinson, one house, Victoria-avenue; Mr. G. E. Kirkwood, two houses, Richmond-street; Mr. C. Raper, additions, 27, Southcoates-avenue; G. & T. Earle, Ltd., concrete chimney, Wilmington; Mr. C. Riley, garage, William-street; Humber Toy Co., alterations and additions, Aldbro'-street; Messrs. Payne & Forrester, cooperage, Hood-street; British Oil and Cake Mills, Ltd., shed alterations, Foster-street, Stoneferry; Reckitt & Sons, Ltd., boiler house, Stoneferry; Major & Co., air compresser house and additions Sculcoates; G. Moon & Co., Ltd., offices, Clarence-street; Hull Concrete Stone Co., new premises, Lorraine-street; G. & T. Earle, Ltd., offices, Wilmington; the Universal Oil Co., warehouse, Stoneferry; British Oil & Cake Mills, Ltd., refinery, Foster-street, Stone ferry; Mr. W. Dibb, shop front, 22, Cottingham-road; Mr. G. Cargill, garage, "Woodville," Pearson Park; Mr. E. W. Mallison, motor shed, Cottingham-road; Mr. J. A. Dew, additions, 155, Westbourne-avenue; Hewitt Bros., Ltd. additions, "City Hotel," Lowgate; Trustees, St. Stephen's Schools, additions, Spring-street; Mr. C. Hartley, additions, Subway-street; Colonel R. Hall, garage, "Welham Lodge," Newland Park; Mr. J Hollingworth, garage, Newington-street; Limmer & Trinidad Asphalte Co., new premises, Dairycoates; Mr. J. Smith, stables, 169, Fountain-road; Reckitt & Sons, Ltd., planing and machine room, Dansom-lane; Mr. H. Wharam, additions, Liddell-street; Mr. G. H. Wright, stables, 7 and 8, Bourne-street; H. W. Matthews & Co., Ltd., additions, Prince's-avenue; Messrs. J. Foster & Co., additions, Prince's-avenue; Messrs. E. M. & G. W. Flowers, stables, cartshed, &c., Withernsea-street; Bentley's Laundry, additions, Plane-street; Mr. H. Clayton, garage, 147, Westbourne-avenue.

KENDAL.—Plans passed: Petrol store and filling shed at Beezon-road, for the Shell Marketing Co., Ltd.; additions to the Kendal Workhouse, for the Kendal Board of Guardians (architect, Mr. M. G. Shaw); two entrance lodges at Singleton Park, for Mr. J. R. King (architect, Mr. M. G. Shaw).

NORTHAMPTON.—Plans passed: Alterations to premises, 37, Bridge-street, for Mr. R. Hawtin; motor garage, Abington Park-crescent, for Mr. Hy. Crask; drainage, 14, Grove-road, for Messrs. Phipps & Co., Ltd.; roof of yard, &c., Abington-street, for Messrs. Stimpson Bros.; additions to factory, Clare-street, for the Allied Boot & Shoe Co.; staircase and lavatories, Victoria-street, for Lotus, Ltd.; store rooms, Chaucer-street, for Mr. Goodliffe; rebuilding "Northampton Arms," Public House, Deal-street, for Messrs. P. Phipps & Co., Ltd.; alterations to warehouse and office, Green-street, for Mr. S. Underwood; alterations and additions, 94, Balmoral-road, for Mr. J. V. Rowntree.

OSSETT.—Plans passed by T.C.:—Addition to Hawthorne Villa, Runtlings, for Mrs. George W. Smith; house off Dewsbury-road, for Mrs. H. E. Oldroyd; carbonising place in Crownlands-lane, for Mr. Allen Giggal; bungalow, Headlands-lane, for Mrs. A. L. Clay; pump house, at Ings Mill, for Messrs. Mitchell & Co., Ltd.; motor garage, West Wells House, for Mr. R. Smith; weaving shed at Ings Mill, for Messrs. Mitchell & Co., Ltd.; engineering workshop, Dewsbury-road, for Mr. J. W. Chapman; extension to Warneford-avenue for Messrs. Hepworth & Moorhouse.

PLYMOUTH.—Plans passed: Mr. Uglow extension of cafe, 18 Lockyer-street; Mr. H. Papps, garage rear of Waverley Hotel, Millbay-road; Mr. F. Down, alterations, 19, Greenbank-avenue; The Octagon Brewery Co., addition to scullery, Laira Hotel; Mr. W. Cooper, new shed, carriage works, Bath-street; Mr. C. T. Young, garage, store, &c., 68, 69 and 70, North-street; Mr. Ellis, addition to house, 11, Edith-street, St. Budeaux, Devonport; Plymouth Co-operative Society, Ltd., wagon shed, Radnor-place, and alterations, 34–36, Morley-street, and 1, York-street; Mr. J. H. Lillicrap, garage and store, rear of 24 Mutley Plain; Mr. J. B. James, office and caretaker's quarters, Richmond Walk.

ROTHERHAM.—Plans passed: Messrs. Mappin's Masbro' Old Brewery, Ltd., Corporation-street, block of business premises, &c., and cask washing shed; Messrs. J. J. Habershon & Sons, Holmes Rolling Mills, structural steel-framed building; Messrs. Wragg & Biggin, Ltd., Armer-street, one storey building; Worksop & Retford Brewery Co., Ltd. 5, Orchard-street, additions; Mr. F. Beaumont, Wortley-road, bungalow; Mr. Thos. Cartwright, Cottenham-road, dweling-house; Mr. A. Guest, Ramsden-road pair semi-detached dwelling houses; Rotherham Building Co., St. Leonard's-road, pair semi-detached dwelling houses; Imperial Steam Laundry Co., South-street, mess room, kitchen and office; Mr. C. Waterhouse, Rawmarsh-road, tripe purveyor's premises; Messrs. Price & Son, 12, Princess-street, extension to workroom; Messrs. Smith Bros., Vicarage-lane, sanitary improvements;

SALFORD.—Plans passed: construction of—Garage, Ellor-street and Black Ditch, Pendleton; motor garage, 1, Delamere-avenue, Pendleton; drying store Wallness-road and Windsor Bridge, Salford; 171 dwelling-houses, Oaklands-road, Littleton-road and Radford-street, Lower Kersal. Reconstruction of—Front wall, Regent-road and Wellington-place, Salford. Alterations to—Offices and stores, Hulme-street, Salford; Regent Opera House, Cross-lane, Salford. Additions to—Works, St. Simon-street, Salford; works, Ordsall-lane, Salford. Extension of—Covered yard, Blackfriars-road, Salford; works, Montford-street and Vere-street, Weaste; boiler house, works, Meadow-road, Broughton; works, Seaford-road, Blandford-street, and Hampton-street, Pendleton. Drainage of—Two dwelling-houses, Cavendish-road and Vernon-road, Broughton. Construction of—Warehouse, Quay-street and Yorkshire-street, Salford; factory, Weaste-road South, Pendleton; offices and warehouse, Gordon-street, Broughton; two semi-detached dwelling-houses, Cavendish-road, Broughton; transport depot, East Ordsall-lane, Islington-street and Queen's-terrace, Salford; boiler house, Bute-street, Weaste. Additions and extensions to Warehouse premises and offices, Great Cheetham-street West and Hilton-street, Broughton. Construction of Workshop, Tootal-road, Myrtle Grove and Weaste-road, Weaste. Rebuilding of Schoolroom, Langworthy-road, Pendleton. Alterations to—Works, Springfield-lane, Salford.

SOUTHPORT.—Major J. Stewart has held an inquiry into the application of the Corporation for sanction to borrow £15,000 for the purchase of the premises of the Manchester & District Bank, Ltd., and £2,950 for the widening of Nevill-street and the laying out of the gardens in front of a picture palace and Westminster-buildings. The Town Clerk stated that the bank was required for the extension of the municipal buildings.

STEVANAGE.—Plans passed: Mission hall, Mr. A. W. Dymoke, for Mr. E. H. Jerrard; house, Fishers Green-road, for Mr. G. Mercier.

WREXHAM.—The Housing and Town-Planning Association propose to erect 2,000 houses at Llay, a new mining village near Wrexham. A new colliery is in course of development there, and will, when completed, be the largest in the North Wales coalfield. The association have already secured land for 1,000 houses, and intend to erect 200 dwellings by the autumn.

YORK.—Plans approved: Trustees Monk Ward, Co. Club, club and steward's house, East-parade; Boots, Ltd., alterations, 30–31, Coney-street; British Oil & Cake Mills, alterations, Skeidergate; R. Burton, garage, Chingford Lodge, New Walk-terrace; St. Stephen's Orphanage, alterations, 89, The Mount; Mr. I. Poad, additions, Thornton House, Heslington-lane; Messrs. Craven & Son, additions, Coppergate; Mr. W. West, additions, 129–31–33, East-parade; Mr. A. Cutforth, additions, 19, Low Ousegate; Messrs. Leak & Thorp, additions, Coney-street; Messrs. Perkins, Imeson & Jackson, re-drainage, Blenheim-place; Yorks. Insurance Co., alterations, Old Fire Station, St. Andrewgate.

FIRES.

BIRMINGHAM.—A fire has occurred in Newhall-street at the extensive premises in the joint occupation of Messrs. Leir & Salaman, Ltd., and the Potosi Silver Co.

BRISTOL.—The paper warehouse of Messrs. Burleigh, at College Green, has been destroyed by fire.

WISHAW.—A fire has occurred at the works of the Atlantic Land and Marine Engine Co., Ltd., in Glasgow-road, and serious damage to the buildings resulted.

WOODALL SPA.—Victoria Hotel has been destroyed by fire.

* See also our List of Competitions, Contracts, &c.

COMPETITIONS, CONTRACTS, &c.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this number. Contracts iv ; Competitions iv ; Public Appointments c; Sales by Auction cvi. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender ; that a fair wages clause shall be observed ; that no allowance will be made for tenders ; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in ; the name and address at the end is the person from whom or place where, quantities, forms of tender, &c., may be obtained.

BUILDING AND PAINTING

APRIL 16.—**Barnham.**—COTTAGES.—Erection of 22 cottages on Barnham and Cholter estates, for the West Sussex C.C. Mr. H. P. Roberts, County Architect, Thurloe House, Worthing. Deposit, £1 1s.

APRIL 16.—**Bodmin.**—FARM BUILDINGS.—Erection of house and farm buildings at Green-lane Farm for the T.C. Mr. R. T. Buscombe, Borough Surveyor, Municipal Offices, Bodmin.

APRIL 16.—**Burry Port.**—EXTENSION.—Extension of Burry Port Co-operative Society's central premises. Quantities at premises. Deposit, £1 1s.

APRIL 16.—**Cosford.**—HOUSES.—Erection of 42 houses in various parishes, for the R.D.C. Mr. L. Crowfoot, Long Melford, Sussex. Deposit, £2 2s.

APRIL 16.—**Deptford.**—HOUSES.—Erection of 187 houses for the B.C. Borough Surveyor, Town Hall, New Cross-road, Deptford. Deposit, £3 3s.

APRIL 16.—**East Sussex.**—LAVATORIES.—New, and alteration to existing, at East Grinstead Public Elementary Council School. Mr. F. J. Wood, M.S.A., County Surveyor's Dept., County Hall, Lewes.

APRIL 16.—**Fordingbridge.**—HOUSES.—Erection of 20 cottages at Fordingbridge and 12 at Martin for the R.D.C. Mr. E. Bird, architect, Castle-lane, Southampton. Deposit, £2 2s.

*APRIL 16.—**Northwich.**—HOUSES AND SEWERS, HOUSES.—Erection of first 100 of 300 for the U.D.C. Clerk to the Council, the Council House, Northwich.

APRIL 16.—**Ovenden.**—WORKSHOP.—Erection of engineer's workshop in Shay-lane. Mr. W. Hall, architect, 1, Harrison-road, Halifax.

APRIL 16.—**Sibsey.**—COTTAGES.—Erection of pair of cottages at Frithville and pair at Sibsey, for the R.D.C. Mr. O. B. Giles, Clerk, 28, Wide Bargate, Boston. Deposit, £2 2s.

APRIL 16.—**West Sussex.**—COTTAGES.—Erection of 22, for the C.C. [Mr. Hayden P. Roberts, F.R.I.B.A., County Architect, Thurloe House, Worthing.

APRIL 17.—**Barnsley.**—HOUSES.—Erection of 283 houses for the T.C. Messrs. Dyson, Coles & Cawthorne, architects, 10, Regent-street, Barnsley.

APRIL 17.—**Bexley Heath.**—HOUSES.—Erection of 426 houses or part of that number in connection with the Welling Housing Scheme. Mr. W. T. Howse, Surveyor to the Council, Council Offices, Bexley Heath.

APRIL 17.—**Maldon.**—HOUSES.—Erection of 16 houses, for the T.C. Mr. T. R. Swales, Borough Engineer, Maldon.

APRIL 17.—**Seghill.**—HOUSES, ROADS, ETC.—For erection of 40 houses and construction of roads and sewers for the U.D.C. Messrs. Knowles, Oliver & Leeson, architects, 25, Collingwood-street, Newcastle-on-Tyne. Deposit £2 2s.

APRIL 17.—**Steyning, Sussex.**—COTTAGES.—Erection of 16 at Lansing, and 40 at Henfield, for the R.D.C. Mr. F. A. Crouch, 47, Worcester Villas, Hove.

APRIL 18.—**Tonbridge.**—HOUSES.—Erection of 136 houses in various parishes for the R.D.C. Mr. F. Harris, surveyor, Broadway, Southborough, Tunbridge Wells. Deposit, £2 2s.

APRIL 19.—**Aspatria.**—ALTERATIONS.—Alterations, etc. to Central Stores for the Aspatria Industrial Co-operative Society. Mr. H. Bedfield, architect Workington.

APRIL 19.—**Bristol.**—REPAIRS, &C.—For painting repairs, &c., at 230 and 224, Southmead-road, for the Board of Guardians. Mr. J. J. Simpson, Clerk, St. Peter's Hospital, Bristol.

APRIL 19.—**Cardiff.**—PAINTING.—Painting and colouring various schools for the T.C. Mr. J. J. Jackson Director of Education, City Hall, Cardiff.

APRIL 19.—**Eccles.**—REPAIRS.—For general repairs to bandstands at Recreation Grounds for the T.C. Borough Surveyor, Town Hall, Eccles.

*APRIL 19.—**Fleetwood.**—HOUSES.—Erection of 150, in concrete, for the U.D.C. Mr. Bertram Drummond, architect, 54, Adelaide-street, Fleetwood.

APRIL 19.—**Hessle.**—HOUSES.—Erection of 54 houses for the U.D.C. Mr. J. M. Dossor, architect, Waterloo Chambers, Hull. Deposit £2.

APRIL 19.—**Kildare.**—ADDITION.—For addition to the Infirmary for the County Infirmary Committee. Mr. J. Rocke, County Surveyor Naas.

*APRIL 19.—**Lewisham.**—HOUSES.—Erection and completion of 30 on the Lewisham Park site for the Metropolitan Borough. Borough Surveyor, Town Hall, Catford, S.E.6.

APRIL 19.—**Newton Abbot.**—HOUSES.—Erection of houses, in pairs, in the following parishes :—Chudleigh (12), Ipplepen (16), Kingsteignton (16), Moretonhampstead (16), Chudleigh Knighton (8) for the R.D.C. Mr. F. Horner, Clerk, 64, East-street, Newton Abbot.

APRIL 19.—**Rochford.**—ALTERATIONS.—For additions etc. at Poor Law Institute for the Board of Guardians. Master, Poor Law Institute, Rochford, Essex.

APRIL 19.—**West Riding of Yorkshire.**—COTTAGES, &c.—Erection of cottages and homesteads at Hawksworth, Pottleton, Rufforth and Bythen, for the West Riding Small Holdings Committee. Architect, Small Holdings Committee, County Hall, Wakefield.

APRIL 20.—**Birmingham.**—PAINTING.—For painting buildings at Saltley Works for the Birmingham, Tarre and Ree District Drainage Board. Mr. J. D. Watson, Engineer, The Rookery, Erdington Park, Birmingham.

APRIL 20.—**Brighton.**—DECORATIONS, &C.—For repairs, decorations, &c., at the schools, for the Board of Guardians. Mr. E. Wallis Long, architect, 56, East-street, Brighton.

APRIL 20.—**Builth Wells.**—HOUSES AND ROADS.—Erection of 24 houses and laying out site for the U.D.C. Mr. H. Waters, Central Chambers, Brynmauer ; and Mr. Telfer Smith, Builth Wells, architects. Deposit £1 1s. for each of four sets of quantities.

APRIL 20.—**Leeds.**—HOUSES.—Erection of 34 houses on Wythen House Estate, for the Corporation Mr. W. T. Lancashire, City Engineer, Leeds. Deposit £1 1s.

APRIL 21.—**Barnet.**—COTTAGES.—Erection of 24 cottages at Harris-lane, Shenley, for the R.D.C. Clerk, Council Offices, Boreham Wood.

APRIL 21.—**Birmingham.**—BUILDINGS.—Erection of additional buildings at Children's Receiving Home, Sumner Hill, for the Board of Guardians. Mr. J. Curtis, Clerk, Union Offices Birmingham. Deposit £5.

APRIL 21.—**Fulham.**—PAINTING.—Cleaning and painting Central Library for the B.C. Borough Surveyor, Town Hall, Fulham.

APRIL 21.—**Hackney.**—REPAIRS, PAINTING.—Renewals to woodwork painting exterior and portions of interior at the Public Baths, Central Library, and three branch libraries. Borough Engineer and Surveyor, Town Hall, Hackney, E. 8.

APRIL 21.—**Hemsworth.**—HOUSES AND ROADS.—Erection of 20 houses and construction of roads and sewers for the R.D.C. Mr. W. T. Lynam, Surveyor Council Offices, Hemsworth. Deposit £1 1s.

APRIL 21.—**London.**—SHELVING.—Supply and fixing for H.M. Office of Works of white deal shelving. Controller of Supplies, H.M. Office of Works, King Charles street, S.W.

APRIL 22.—**Castle Donnington.**—HOUSES, &C.—Erection of 30 houses and roads and sewers at Keyworth, for the R.D.C. Messrs. A. Eaton & Son, architects, 6, St. James-street, Derby Deposit £2 2s.

APRIL 22.—**Kensington.**—COTTAGES.—Demolition of workhouse buildings at Notting-hill and erection of 8 cottages, for the B.C. Borough Engineer's Dept., Town Hall, Kensington. Deposit £2 2s.

APRIL 22.—**Manchester.**—REPAIRS.—Repairs at Art Gallery, at Heaton Park, for the Corporation. City Architect, Town Hall, Manchester. Deposit, £1 1s.

APRIL 22.—**Prestwich.**—HOUSES.—Erection of 141 houses, for the U.D.C. Mr. C. H. Morgan, Engineer, Town Hall, Prestwich. Deposit, £2 2s.

APRIL 22.—**Southwark.**—PAINTING.—Painting and cleaning at the Infirmary, for the B.G. Mr. A. Saxon Snell, architect, 9, Bentinck-street, W. Deposit, £5.

APRIL 22.—**Wandsworth, S.W.**—PAINTING.—To be carried out at the Infirmary for the Guardians, St. John's Hill, Wandsworth, S.W. 18. Mr. F. J. Curtis, Clerk, Union Offices, St. John's Hill, Wandsworth, S.W. 18.

APRIL 23.—**Hurlingham.**—STANDS.—Erection of temporary or permanent stands to accommodate 30,000 spectators, for the Committee. Lt.-Col. A. A. Duff, manager, Hurlingham Club, Fulham, S.W.

APRIL 23.—**London.**—ENGINE HOUSE, &C.—Erection of engine house, cottage, &c., at Shooters'-hill, for the Metropolitan Water Board. Chief Engineer's Dept., South-place, Finsbury-pavement, E.C. Deposit, £5.

*APRIL 23.—**Ylewsley.**—HOUSES.—Erection of 400 for the U.D.C. Mr. J. Lewis, Council's Engineer and Surveyor.

APRIL 24.—**Aberaychan.**—HOUSES.—Erection of 248 houses (three sections) for the U.D.C. Messrs. Kenshole & Beven, architects, Bargoed. Deposit £5 5s

APRIL 24.—**Bedford.**—HOUSES.—Erection of six houses at Great Barford and six at Wootton for the R.D.C. Council offices, 115, High-street, Bedford (for Great Barford houses) and Mr. K. Gammell, architect, 17, St. Peters, Bedford (for Wootton houses).

APRIL 24.—**Brampton.**—HOUSING.—Erection of six houses at Holymoorside for the U.D.C. Mr. B. Deeping, architect, Glumen Gate, Chesterfield.

APRIL 24.—**Horsham.**—HOUSES.—(1) Contract No. 15, two pairs ; (2) Contract No. 18, four pairs ; (3) Contract No. 19, four pairs. Mr. W. R. Guilford, Surveyor to the Council, Albion-terrace, Horsham.

APRIL 24.—**Leeds.**—PAINTING.—For painting Kingston Unity Club. Mr. F. Hawkins, Secretary, Club, Union-street, Leeds.

APRIL 24.—**London.**—Repairs and painting and other works, at the Infirmary, Backham-street, Notting-hill, for the Guardians of the Poor of the parish of St. Marylebone. Steward of the Infirmary.

APRIL 24.—**St. Ercs.**—SCHOOL.—Erection of national school buildings at St. Ercs, County Kerry. Secretary, Office of Public Works, Dublin.

APRIL 24.—**Stafford.**—INSTITUTE.—Erection of a county mining institute, at Ford Green, Smallthorne, for the E.C. Director of Education, County Education Offices, Stafford.

APRIL 24.—**Swinton.**—HOUSES.—For erection of 64 houses on Light Bourne Green Estate, and 166 houses on the Temple Lodge Estate, for the U.D.C. Mr. F. Knight, architect, 5, Cross-street, Manchester.

APRIL 24.—**Wortley.**—HOUSES.—Erection of 112 houses at Ecclesfield for the R.D.C. Mr. Wynyard Dixon, architect, Hartshead, Sheffield. Deposit £2 2s.

APRIL 26.—**Dalkeith.**—HOUSES.—Construction of 40 houses, for the T.C. Mr. A. Murray Hardie, architect, 20, George-street, Edinburgh.

APRIL 26.—**London.**—Flooring and reflooring to pipe ducts in the wards at their Workhouse, Northumberland-street, W., for the Guardians of the parish of St. Marylebone. Mr. A. Saxon Snell, architect, 9, Bentinck-street, W. 1.

APRIL 26.—**Preston.**—PAINTING.—For painting at Whittingham Asylum, for the Committee of Visitors. Mr. H. E. Morgan, Clerk at the Asylum.

APRIL 26.—**St. Helens.**—ADDITIONS.—(1) Plastering and slating, (2) plumbing, gasfitting, glazing and painting to the Cowley Secondary School for Boys. Messrs. Biram & Fletcher, architects, George-street, St. Helens.

APRIL 26.—**Surbiton.**—HOUSES.—Erection of 50 at Surbiton-hill for the U.D.C. Council Offices, Surbiton.

APRIL 26.—**Wem.**—HOUSES.—Erection of houses, in various parishes for the R.D.C. Mr. A. G. Eccleston, clerk, 30, Noble-street, Wem, Salop. Deposit £1 1s.

APRIL 27.—**Glasgow.**—TRAMWAY DEPOT.—Various trades in erection of depot at Park Head, for the Tramways Department. Mr. J. Dalrymple, General Manager 46, Bath-road, Glasgow.

*APRIL 27.—**Hants.**—COTTAGES.—Erection of 7 pairs at Titchfield Farm Settlement for the Commissioners of His Majesty's Works. Director of the Farm Settlement, Abbey Cottage, Titchfield, or of H.M. Office of Works, Storey's Gate, Westminster, S.W.1.

APRIL 27.—**Ipswich.**—REPAIRS, &C.—For works and repairs, &c., at Ipswich Barracks, for the War Department. The Officer Commanding Royal Engineers, Flagstaff-road, Colchester.

APRIL 28.—**Doncaster.**—RACE COURSE BUILDINGS.—For erection of further accommodation on race course, for the T.C. Mr. R. E. Ford, Surveyor, 3, Priory-place, Doncaster. Deposit £2 2s.

*APRIL 28.—**Margate.**—NURSING HOMES.—Erection of two each for 20 children at the Royal School for Deaf and Dumb Children, Margate. Mr. H. Carter Pegg, architect, 35, Parliament-street, Westminster, S.W.1.

APRIL 28.—**Newport Pagnell.**—HOUSES.—Erection of 10 for the R.D.C. Mr. W. B. Stonebridge, M.S.A, architect, 26, St. John's-street, Bedford.

APRIL 29.—**Greenwich.**—PAINTING AND REPAIRS.—External painting and general repairs at the Infirmary of the Greenwich Union, Vanbrugh-hill, East Greenwich. Mr. Louis Jacob, Board's Surveyor 30, Bloomsbury-square, W.C. 1.

*APRIL 29.—**St. Georges in the East.**—PAINTING.—Cleaning and paint works at relief office and dispensary of the Board of Guardians. Mr. R. M. Lochner Clerk, Guardians Office, Raine-street, E.

APRIL 30.—**Alderley Edge.**—COTTAGES.—Erection of 22 cottages, for the U.D.C. Mr. H. Sheldon, Surveyor, Alderley Edeg.

APRIL 30.—**Bridgnorth.**—HOUSES.—Erection of 32 houses for the T.C. Borough Surveyor, Bridgnorth.

APRIL 30.—**Gellygaer.**—HOUSES.—Erection of 68 houses and construction of roads and sewers at Bargoed, for the U.D.C. Mr. P. G. Williams, architect, Council Offices, Hengoed. Deposit £2 2s. each contract.

APRIL 30.—**Gravesend.**—PAINTING.—Exterior painting of Royal-terrace Pier, for the Estate Co., Ltd. Mr. W. J. Holland, secretary, Royal-terrace Pier Estate Co., Gravesend.

*APRIL 30.—**Islington, N.**—Conversion, painting, whitewashing, external and internal at Nos. 65, 67, and 69, Hornsey Rise ; and Nos. 1 and 2, Cromartie-road, N., for the Guardians of the Poor. Mr. Edmund J. Harrison, 23, Berkeley-road, Crouch End, N.

*APRIL 30.—**Littlehampton.**—HOUSES.—Erection of 66 of various types, together with the drains and fencing, for the U.D.C. Mr. W. A. Clegg, Surveyor to the Council, Town Offices, Littlehampton.

*APRIL 30.—**Marlborough.**—COTTAGES.—Erection of 14 in various districts for R.D.C. Mr. J. W. Brooke, Architect, 21, The Green, Marlborough.

*MAY 1.—**Campden, Glos.**—HOUSES.—Erection of 26, also formation of new road. Mr. Harold E. Dicks, architect Evesham.

MAY 1.—**Carlisle.**—ALTERATIONS.—For alterations to Lowther-street schools for the T.C. Mr. H. C. Marks, Surveyor to E.C., 96 Fisher-street, Carlisle. Deposit £1 1s.

*MAY 1.—**Epsom.**—REPAIRS, &C.—Repairs, cleaning and painting at the Cuddington Hospital, for the Visiting Committee. Mr. A. L. Williams, architect, Ashley-road, Epsom.

*MAY 3.—**London.**—Repainting of various bridges for the L.C.C. Chief Engineer, County Hall, Spring Gardens, S.W.1.

*MAY 3.—**St. Helens.**—ERECTIONS AND ADDITIONS.—Erection and completion of additions to Cowley Secondary School for Boys. Messrs. Biram & Fletcher, architects, George-street, St. Helens.

*MAY 3.—**West Hampnett.**—HOUSES.—Erection of 17 in various districts for the R.D.C. Mr. John Dovaston, architect, Pellant House, Chichester.

MAY 5.—**East Grinstead.**—HOUSES.—Erection of 14 houses at Worth for the R.D.C. Mr. C. Turton, architect, 6 High-street, East Grinstead. Deposit £2 2s.

✱MAY 10.—**Reigate.**—HOUSES.—Erection of 52 houses and incidental works in connection therewith at the Hooky Mead site. Office of the Municipal Buildings, Reigate.

MAY 10.—**Tilbury.**—HOUSES.—Erection of 1,520 houses, for the U.D.C. Mr. S. A. Hill-Willis, engineer, Council offices, 47, Dock-road, Tilbury. Deposit, £10 10s.

✱MAY 13.—**Bermondsey, S.E.**—REPAIRS, ETC.—To playground and pathways at the Shirley Schools, Wickham-road, Shirley, near Croydon, for the Guardians. Messrs. Newman & Newman, 283, Tooley-street, S.E. 1.

✱MAY 13.—**Bermondsey, S.E. 1.**—REPAIRS, ETC.—At the Bermondsey and Rotherhithe Hospital and the Relief Offices, Lower-road, Rotherhithe, for the Guardians. Messrs. Newman & Newman, architects, 283, Tooley-street, S.E. 1.

✱NO DATE.—**Maidenhead.**—HOUSES.—Erection of 86 on two sites in Cookham-road, being the first instalment for the Borough. Borough Surveyor, Guildhall, Maidenhead.

FURNITURE, MATERIALS, etc.

APRIL 19.—**Tenterden.**—MATERIALS.—Supply of road materials to the T.C. Mr. W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden.

APRIL 21.—**Glasgow.**—MATERIALS.—For supply of materials to the Baths Depot of the Corporation. Mr. R. B. Thomson, general manager, 38, College-street, Glasgow.

APRIL 21.—**Chelmsford.**—PIPES.—Supply of 4,000 yards of 4 in. agricultural pipes to the Joint Sewerage Committee for the U.D.C. and R.D.C. Surveyor, 16, London-road, Chelmsford.

ENGINEERING, IRON AND STEEL.

APRIL 19.—**Dundee.**—HEATING.—For heating system at Mitchell-street School, for the Education Authority. Mr. J. E. Williams, Executive Office, Education Offices, Dundee.

APRIL 20.—**Lambeth.**—CLEARING.—For periodical cleaning of boilers and other plant at various establishments of the Board of Guardians. Mr. J. L. Goldspink, Clerk, Brook-street, Kennington-road, S.E.

APRIL 20.—**London.**—STEELWORK.—For steelwork for bridges for the Great Indian Peninsula Railway Co. Mr. R. H. Walpole, Secretary, 48, Copthall-avenue, E.C. Fee £1.

APRIL 21.—**Yeoden.**—RESERVOIR.—Construction of covered service reservoir and laying pipes, for the Yeadon Waterworks Co. Mr. H. A. Johnson, engineer, 15, The Exchange, Bradford.

APRIL 23.—**Durham.**—BRIDGE.—For taking down existing Chester Town Bridge and rebuilding new bridge for the Durham C.C. Mr. A. E. Brookes, County Surveyor, Shire Hall, Durham. Deposit £2 2s.

APRIL 24.—**Guernsey.**—TOWER.—Erection of concrete tower on Roustel Rock, in Little Russel-passage, for St. Peter Port Harbour Committee. Mr. J. H. Duquemin, States Engineer, Guernsey.

APRIL 26.—**Edinburgh.**—STRUCTURAL STEEL WORK.—For structural steel work required in connection with erection of public washhouse at Causewayside, for the T.C. Mr. J. A. Williamson, City Architect, Public Works Office, Edinburgh.

APRIL 26.—**Lichfield.**—HEATING.—Heating of Corn Exchange, for the T.C. Mr. P. H. Benn, Surveyor, Guildhall, Lichfield. Deposit, £1 1s.

MAY 1.—**Manchester.**—GAS WORKS.—Construction of two retort-houses and vertical retort installations on the continuous system, coal and coke handling plant, &c., at the Bradford-road Station, for the Gas Committee. Superintendent, Gas Department, Town Hall, Manchester. Deposit, £2 2s.

MAY 11.—**Liverpool.**—PUBLIC WASH-HOUSE.—Engineering work required in addition to public washhouse for the Corporation. Engineer, Baths Department, Municipal Buildings, Liverpool. Deposit, £1 1s.

MAY 25.—**South Africa.**—STRUCTURAL STEEL.—Supply of structural steel for extension of goods shed at Capetown for the South African Railways. High Commissioner for South Africa, 32, Victoria-street, S.W.

ROAD, SANITARY, AND WATER WORKS.

APRIL 16.—**Doncaster.**—SEWERAGE WORKS.—Construction of sewerage works at Armthorpe, for the R.D.C. Mr. W. R. Crabtree, Union Offices, Doncaster. Deposit, £2 2s.

APRIL 16.—**East Grinstead.**—SANITARY WORK.—Erection of new and alterations to existing lavatories at Council Schools, for the East Sussex E.C. Mr. F. J. Wood, County Surveyor, County Hall, Lewes.

APRIL 20.—**Cheshunt.**—ROADS.—Laying 50,000 super yards of tar macadam, 2,000 yards of granite kerbing and 2,000 yards of concrete kerbing for the U.D.C. Mr. J. E. Sharpe, Surveyor, Manor House, Cheshunt.

APRIL 20.—**Doncaster.**—CULVERT.—Construction of brick and concrete culvert for the T.C. Mr. F. O. Kirby, Borough Engineer, Mansion House, Doncaster.

APRIL 20.—**Wealdstone.**—ROADS.—(*a*) Re-surfacing High-street and High-road; (*b*) making up footpaths with stone, for the U.D.C. Mr. H. Walker, Surveyor, Council Offices, Wealdstone.

APRIL 21.—**Nelson.**—WATERWORKS.—(1) Supply of 880 tons of cast-iron pipes; (2) constructing road and laying pipes, for the T.C. Mr. C. E. Newton, engineer, 19, Cooper-street, Manchester.

APRIL 21.—**Airdrie.**—ROADS.—Construction of roads and sewers on Aitchison-street housing site for the T.C. Mr. J. K. Frazer, Borough Engineer, Airdrie.

APRIL 22.—**Beaconsfield.**—ROADS AND SEWERS.—Construction of roads and sewers on housing site. Mr. H. C. Lander, architect, Letchworth. Deposit, £1 1s.

APRIL 23.—**Chertsey.**—SEWERAGE WORKS.—For sewerage works, for the U.D.C. Mr. G. Midgley Taylor, 36, Victoria-street, Westminster, S.W. Deposit, £5.

APRIL 24.—**Barnstaple.**—SEWERS.—Construction of 193 yards of 15 in. and 856 yards of 12 in. sewers, for the T.C. Mr. E. Y. Saunders, Borough Surveyor, Barnstaple. Deposit £2 2s.

APRIL 24.—**Wortley.**—ROADS.—Construction of roads and sewers at Ecclesfield housing site for the R.D.C. Mr. F. Thurlby, Surveyor, Council Offices, Greenside, Sheffield. Deposit £1 1s.

APRIL 26.—**Tipton.**—SEWERS.—For sewering of Broomfield District for the U.D.C. Mr. W. H. Jukes, Engineer, Public Offices, Tipton. Deposit £3 3s.

APRIL 27:—**Kearsley.**—ROADS, &c.—For sewering and road works, in connection with housing scheme, for the U.D.C. Mr. W. J. Lomax, architect, 11, Foldstreet, Bolton. Deposit £2.

APRIL 28.—**Pontypridd.**—SEWER.—Diversion of main sewer at Trehafod and Gyferllon, near Pontypridd for the Ystradylogwy and Pontypridd Main Sewerage Board. Mr. W. Nicholas, Clerk, Mill-street, Pontypridd Deposit £3 3s.

APRIL 30.—**Devizes.**—WATERWORKS.—Construction of well, adits, and borehole for the T.C. Mr. W. J. Rendell Baker, Borough Engineer, Devizes. Deposit £5 5s.

MAY 4.—**Easington.**—ROADS.—For private street works in the parish of Wingate, for the R.D.C. Surveyor, Castle Eden.

MAY 4.—**Grays.**—SEWERS.—Construction of 5,200 yards of concrete tube and cast-iron sewers etc., for the Thurrock Grays and Tilbury Joint Sewerage Board. Mr. J. Midgley Taylor, Civil Engineer, 36, Victoria-street, Westminster, S.W. Deposit £5.

NO DATE.—**Elsecar.**—TRENCH.—Excavating one mile of trench, for the Elsecar, Wentworth and Hoyland Gas Co. Mr. W. Stenton, Manager, Gas Works, Elsecar, near Barnsley.

Auction Sales, Tenders, &c.

APRIL 16.—**Lyndhurst, Hants.**—Messrs. Waller & King will sell by direction of the Disposal Board at the War Dogs School, Lyndhurst, Hants, hutting, etc. Auctioneers, 17, Above Bar, Southampton.

APRIL 20.—**Beachley, near Chepstow.**—Messrs. Fuller, Horsley Sons & Cassell will sell by direction of the Disposal Board, in lots, at the Grand Hotel, Bristol, contractors' plant, cranes, locos., and other machinery, new vertical motor-driven air compressors by Fullerton, &c. Auctioneers, 11, Billiter-square, E.C. 3.

APRIL 20.—**Bristol.**—Messrs. Fuller, Horsey & Co. will sell, at the Grand Hotel, contractors' plant from the National Shipbuilding Yard, Beachley. Catalogues from the Auctioneers' Offices, 11, Billiter square, E.C. 3.

APRIL 20.—**Dover.**—Messrs. Worsfold & Hayward will sell, by Order of the Disposal Board, at the A.A. Gun Station, St. Radigund's, huts and building material. Auctioneers, Market-square, Dover.

APRIL 20.—**Hemerden, Devon.**—Messrs. Joseph Hibbard & Sons will sell by order of the Board of Trade, at Shaddlewood Mill, South Devon, well-cut stock of hard and soft woods. Auctioneers, Newington Green, Islington, N.

✱APRIL 21 AND 22.—**Feltham.**—Messrs. Geering & Coolyer will sell at St. Alban's Farm, Staines-road, Feltham, builders and contractors' stores. Auctioneers, 2, King-street, St. James's, S.W. 1.

APRIL 21.—**Manadon, S. Devon.**—Messrs. Joseph Hibbard & Sons, will sell by order of the Board of Trade, on the Mill site, Manadon, a stock of well-cut timber. Auctioneers, Newington Green, Islington, N.1.

✱APRIL 21.—**London, N.**—Mr. H. W. Smith will sell by Order of the Trustees the stock and plant of a builder and decorator at 58A, Lynmouth-road, Stamford Hill. Auctioneers, 6, Great James-street, W.C. 1.

APRIL 22.—**Avington, Winchester.**—Messrs. Joseph Hibbard & Sons will sell without reserve by order of Messrs. Timber Trades Services, Ltd., at Shelley-Rolls Estate, stock of English timber comprising about 40,000 feet cube. Auctioneer, Newington-green, Islington, N.

APRIL 23.—**London, W.1.**—Messrs. Herring Son & Daw will sell by direction of the National Council of the Y.M.C.A., at St. Mary's Club, Eaton-square, W.1, temporary and portable buildings.

APRIL 27,-28.—**London, S.E.**—Messrs. Green & Son will sell by direction of the Disposal Board, Huts and Corrugated iron buildings, at the R.A.S.C. Depot, Blackheath. Auctioneers, 72, King-street, Hammersmith.

APRIL 27.—**St. Leonards-on-Sea.**—Messrs. Dyer & Galaway will sell by Order of the Disposal Board, at St. Leonards Brewery Yard, Shepherd-street, third portion of the surplus stores, buildings, &c. Auctioneers, 38, Havelock-road, Hastings.

APRIL 27.—**Slough.**—Messrs. Bradshaw Brown & Co. will sell, by direction of the Disposal Board, plant and machinery at the Motor Transport Depot, Slough. Auctioneers, Billiter-square Buildings, London, E.C. 3,

APRIL 27 AND 28.—**Washford, Somerset.**—Messrs. Joseph Hibbard & Sons, will sell by direction of the Board of Trade, at the Mills, Washford, Somerset, well-cut stock of English timber. Auctioneers, Newington Green, Islington, N.1.

APRIL 28.—**Betchworth, Surrey.**—Messrs. John Churchman & Sons will sell by order of Messrs. Joseph Gardner & Sons (who are relinquishing the English timber trade), valuable plant, machinery and timber, including 4 active heavy draught horses. Auctioneers, Horsham, Sussex.

✱APRIL 28.—**Stratford, E.**—Messrs. Protheroe & Morris will sell by Order of the Trustees, valuable freehold estate situate in Temple Mills-lane. Auctioneers, 67 and 68, Cheapside, E.C. 2.

APRIL 29.—**Kensington.**—Messrs. Daniel Watney & Sons will sell at Winchester House, Old Broad-street, important freehold estate situate close to Gloucester-road Station, Kensington.

APRIL 29.—**Near Eltham, Kent.**—Messrs. Daniel Watney & Sons will sell about 64 acres of freehold building land. Particulars, 4A, Frederick-place, Old Jewry, London, E.C. 2.

✱MAY 3.—**London, S.W.1.**—TIMBER.—Quantity of useful timber laying at Woodgrange Park Goods Yard, L.T. & Southend Railway. Auctioneers, Robins and Hine, 12A, Waterloo-place, S.W.1.

MAY 4.—**London, E.C.**—Mr. Joseph Stower will let by auction at Winchester House, Old Broad-street, No. 23 and 25, Maddox-street, on a building lease for 99 years, with vacant possession. Auctioneers, 43, Chancery-lane, W.C.

MAY 4 AND 5.—**Withington, Gloucester.**—Messrs. Joseph Hibbard & Sons will sell without reserve, by Order of the Board of Trade, at Chedworth Camp, stock of hard and soft woods of various kinds of poplar woods. Auctioneers, Newington Green, Islington, N. 1.

MAY 5.—**Seaford, Sussex.**—Messrs. Chapman & Martin will sell at the South Camp, Seaford, camp buildings. Auctioneers Station Approach, Seaford.

MAY 6.—**Salfords, Surrey.**—Messrs. Joseph Hibbard & Sons will sell by Order of the Board of Trade, at the Depot, Salfords Mill, stock of hard and soft woods. Auctioneers, Newington-green, Islington, London, N. 1

MAY 7.—**Salford.**—Messrs. Hibbard & Sons will include in their sale at Salford Mill sawmill machinery

✱MAY 11.—**Hull.**—Messrs. N. Easton & Sons will sel at their Mart, Imperial Chambers, Bowlalley-lane, Hull, several valuable brickyards. Auctioneers, Imperial Chambers, Bowlalley-lane, Hull.

✱MAY 12.—**London, W.**—Messrs. Knight, Frank & Rutley will sell in the Hanover-square Estate Room, valuable area of freehold building land known as the Shrewsbury House Estate, Shooter's-hill, about 52¾ acres. Auctioneers, 20, Hanover-square, W. 1.

✱MAY 20.—**London, E.C.**—Messrs. Daniel Watney & Sons will sell, at Winchester House, Old Broadstreet, the following freeholds:—Stone Park, Greenhithe, 25 acres and family residence; compact freehold property, No. 70 to 77, Cowcross-street, Smithfield, also Gilbert's Estate, 11¼ acres. Auctioneers, 4A, Frederick's-place, Old Jewry, London, E.C. 2.

Competitions.

(*See Competition News, page* 448.)

Public Appointments.

APRIL 19.—**Barrow-in-Furness.**—Assistants. Two required in the Borough Surveyor's office. "Assistant,' Borough Engineer and Surveyor Town Hall, Barrow-in-Furness.

APRIL 19.—**Brownhills.**—Architectural Assistant required by the U.D.C. Mr. Geo. F. Grimwood, Council's Architect, Public Offices, Brownhills.

APRIL 19.—**Monmouth.**—Clerk of Works and Costing and General Clerk for the Ebbw Vale U.D.C. Housing Scheme. Mr. P. I. Davies, Housing Architect, Council Offices, Ebbw Vale, Monmouth.

APRIL 19.—**Walsall.**—Building Inspector, for the County Borough. Salary £250 per annum.

✱APRIL 20.—**Stoke-on-Trent.**—Quantity Surveyor required by the Borough. Borough Surveyor, Town Hall, Stoke-on-Trent.

✱APRIL 22.—**Shoreditch, London, E.**—Second Road Foreman required by the Borough. Wages £5 per week. Borough Surveyor, Town Hall, Old-street, E.C.2.

✱APRIL 22.—**West Riding of Yorkshire.**—Assistant in Quantity Surveyor's Department. Mr. Louis J. Newton, M.S.A., County Surveyor County Hall, Wakefield.

✱APRIL 23.—**Margate.**—Clerk of Works, for the borough. Salary £6 10s. per week. Town Clerk, 13, Grosvenor-place, Margate.

✱APRIL 23.—**Somerset.**—Clerk of Works in the Small Holdings Works Department. Salary £5 10s. per week. Works Dept. 1, Belvedere Beach-road, Weston-super-Mare.

APRIL 23.—**Guildford.**—Clerk of Works for the Borough. Salary £6 6s. per week. Mr. Ed. L. Lunn, Supervising Architect, 36, High-street, Guildford.

✱APRIL 24.—**Chorley.**—Clerk of Works required by the R.D.C. Mr. R. E. Aspden, Clerk to the Council, Council Offices, High-street, Chorley.

✱APRIL 24.—**Tottenham.**—Clerk of Works for the Education Committee. Salary £300 per annum, rising by two annual increments of £25 to a maximum of £350. Clerk to the Committee, Education Offices, Philip-lane, Tottenham, N. 15.

✱APRIL 26.—**Wycombe.**—Clerk of Works required by the U.D.C. to act under Council's Architect. Mr. B. L. Reynolds, 12, Euston-street, High Wycombe.

✱APRIL 27.—**Burnley.**—Clerk of Works for the Town Council. Salary £350 a year. Town Clerk, Town Hall, Burnley.

✱APRIL 28.—**Merton and Morden.**—Temporary Builder's or Contractor's Clerk required by the U.D.C. Mr. C. J. Mountifield, Clerk to the Council, Kingston-road, Merton, S.W.19.

APRIL 29.—**Wandsworth, S.W.**—Sanitary Inspector required by the Metropolitan Borough. D. A. Nicholl, Town Clerk, Council House, Wandsworth, S.W. 18.

APRIL 30.—**Calcutta.**—City Architect required for Corporation of Calcutta, India. Salary Rs.1,500 per month, Secretary to the Corporation of Calcutta, Central Municipal Office, Calcutta.

✱APRIL 30.—**Devon.**—Clerk of Works for the County Council. Mr. Brian S. Miller, Clerk to the Council, Castle of Exeter.

✱APRIL 30.—**Stepney.**—Architectural Draughtsman required by the Borough. Salary £250 per annum. Borough Engineer, Municipal Offices, 15, Great Alie-street, E.1.

NO DATE.—**Cheshunt.**—Architects' Assistant for the U.D.C. J. E. Sharpe, Surveyor, Manor House, Cheshunt, Herts.

NO DATE.—**Hong Kong.**—Architectural Assistant for 3 years, with possible permanency, for the Government of Hong Kong. Salary £360–£10–£450, duty allowance of £40 per annum, and war bonus of 20 per cent. on salary and duty allowance. Crown Agents for the Colonies, 4, Millbank, S.W.1.

NO DATE.—**Portsmouth.**—Architectural Assistant experienced required in H.M. Dockyard, Superintending Civil Engineer, Portsmouth.

PRICES CURRENT OF MATERIALS.*

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry.—Ed.]

BRICKS, &c.

Per 1,000	£ s. d.
Alongside, in River Thames up to London Bridge.	4 15 0
Best Stocks	

Per 1000. Delivered at London Goods Stations.

	£ s. d.		£ s. d.
Flettons	3 2 6	Best Blue Pressed Staffordshire	9 11 0
Best Stourbridge Fire bricks	11 10 0	Do. Bullnose	9 13 6
		Blue Wire Cuts	7 18 0

GLAZED BRICKS—

Best White, Ivory, and Salt Glazed Stretchers	24 0 0	D'ble Str'tch'rs	31 10 0
		D'ble Headers	28 10 0
		One Side and two Ends	32 10 0
Headers	23 10 0	Two Sides and one End	33 10 0
Quoins, Bullnose and 4½in. Flats	25 10 0	Splays and Squints	31 0 0

Second Quality, £1 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours, Hard Glaze, £5 10s. extra over white.

	s. d.		
Thames Ballast	19 6	per yard.	delivered
Pit Sand	23 6		
Thames Sand	25 6	" "	2 miles
Best Washed Sand	24 6	" "	radius
½in. Shingle for Ferro-Concrete	23 6	" "	Paddington.
¼in. "	24 6	" "	

Per ton. delivered in London area.

	£ s. d.		£ s. d.
Best Portland Cement	3 18 6	..	4 4 0

71/6 alongside at Vauxhall in 80-ton lots.

Ferrocrete per ton extra on above.	..	..	5 0
Best Ground Blue Lias Lime	2 16 0	at rly. depot.	

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks. The sacks are charged at 2s. 6d. each and credited at 2s. each if returned in good condition within three months.

Grey Stone Lime ..... 61s. 0d. per ton delivered.
Stourbridge Fireclay in s'cks 43s. 6d. per ton at rly. dpt.

STONE.

	s. d.
BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	2 2½
Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube	2 4
Do. do. delivered on road waggons at Nine Elms Depot	2 5
PORTLAND STONE—	
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, L. & S.W.R., South Lambeth Station, G.W.R., and Mileage Station G.W.R., per ft. cube	4 3
Do. do. delivered on road waggons at above stations, per ft. cube	4 4
White basebed, 3d. per ft. cube extra.	
NOTE.—½d ft. cube extra for every foot over 30 ft. average, and ½d. beyond 30 ft.	
YORK STONE, BLUE—*Robin Hood Quality.*	
Delivered at any Goods Station London.	s. d.
Scappled random blocks ..... Per Ft. Cube	11 9
6 in. sawn two sides landings to sizes (under 30 ft. super.) ..... Per Ft. Super	8 1½
6 in. rubbed two sides, ditto ..... "	9 1½
8 in. sawn two sides slabs (random sizes) "	3 7½
2 in. to 2½ in. sawn one side slabs (random sizes) ..... "	2 2
1½ in. to 2 in. ditto, ditto ..... "	1 10
HARD YORK—	
Delivered at any Goods Station London.	s. d.
Scappled random blocks ..... Per Ft. Cube	8 9
6 in. sawn two sides landing to sizes (under 40ft. super.) ..... Per Ft. Super	7 0
6 in. rubbed two sides ditto ..... "	8 3
4 in. sawn two sides slabs (random sizes) "	3 3
8 in. ditto, ditto "	4 4
2 in. self-faced random flags .. Per Yard Super	10 6

WOOD.

GOOD BUILDING DEAL.

Inches	£ s.	
4 × 11	60 0	per standard
4 × 9	58 0	"
4 × 8	46 5	"
4 × 7	46 0	"
3 × 8	46 0	"
2 × 7	46 0	"
2½ × 7	45 0	"
3 × 6	45 0	"
3 × 11	60 0	"
2 × 11	60 0	"
3 × 9	55 0	"
3 × 8	55 0	"
3 × 4½	43 0	"
3 × 4	43 0	"

PLANED BOARDS.

1 × 11	65 0	"
1 × 9	60 0	"

PLAIN EDGE FLOORING.

Inches		
⅜	34/-	square
½	42/6	"
⅝	47/6	"
¾	60/-	"
1	70/-	"

TONGUED AND GROOVED FLOORING.

Inches		
½	47/6	square
¾	60/-	"
1	70/-	"

WOOD (*Continued*).

MATCHINGS (BEST).

Inches		
⅜	34/-	square
½	40/-	"
⅝	54/-	"

BATTENS.

Inches	£ s.	
¾ × 2	39 10	per standard

SAWN LATHS.

Per bundle	—

Dry Wainscot Oak, per ft. super, as inch	0	2	6	to	0 3 0
½ in. do. do.	0	2	0	to	0 2 6
Dry Mahogany—Honduras, Tabasco, African, per ft. super, as inch	0	2	6	to	0 3 0
Cuba. Mahogany	0	3	6	to	0 4 0
Teak (Rangoon, Moulmein or Java), per load	60	0	0	to	85 0 0
American Whitewood planks, per ft. cube	0	18	0	to	1 0 0
Scotch Glue, per cwt.	4	5	0	..	—
Liquid Glue, per gallon	0	17	0	..	—

SLATES.

1st quality slates from Bangor or Portmadoc in truck load delivered London area. Per 1,000 of 1,200.

	£ s. d.
Best Blue Bangor Slates, 24 by 12	55 0 0
" " 22 by 12	44 7 6
First quality " 22 by 11	40 15 0
" " 20 by 12	40 7 6
Best Blue Portmadoc 20 by 10	35 0 0
" " 18 by 10	27 17 6
First quality " 18 by 9	22 15 0
" " 16 by 10	21 10 0
" " 16 by 8	16 17 6

TILES.

	Per 1,000 f.o.r. London. £ s. d.
Best machine-made tiles from Broseley or Staffordshire district	6 15 0
Ditto hand-made ditto	7 0 0
Ornamental ditto	7 2 6
Hip and valley tiles (per dozen)	0 15 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—	s. d.
R. S. Joists, cut and fitted	30 0 0
Plain Compound Girders	32 0 0
" Stanchions	34 0 0
In Roof Work	39 0 0

WROUGHT-IRON TUBES AND FITTINGS—
(Discount off List for lot of not less than £10 net value delivered direct from works. 5 per cent. less carriage forward if sent from London stocks.)

	Sizes up to and including 2 in. Tubes.	Fittings.	Sizes 2½ in. to 6 in. Tubes	Fittings.
Gas	10	12½	12½	25
Water	1½	7½	5	22½
Steam	+8½	—2½	+ ½	—2
Galvanised Gas	+15	—2½	+12½	—15
" Water	+26½	+2½	+22½	—1½
" Steam	+37½	+7½	+32½	—10

L.C.C. COATED SOIL PIPES—London Prices ex works.

	Pipe. s. d.	Bends, stock angles. s. d.	Branches, stock angles. s. d.
2 in. per yd. in 6 fts.	5 6	4 0	4 10
2½ in. " "	6 8	4 5	6 0
3 in. " "	8 1	4 10	7 2
3½ in. " "	9 0	6 0	8 5
4 in. " "	9 6	6 10	9 8

RAIN-WATER PIPES, &c.

	Pipe. s. d.	Bends, stock angles. s. d.	Branches, stock angles. s. d.
2 in. per yd. in 6fts. plain	4 0	2 8	3 0
2½ in. " "	4 6	2 8	3 8
3 in. " "	5 6	3 3	4 10
3½ in. " "	6 6	3 10	5 8
4 in. " "	6 9	4 8	6 10

L.C.C. DRAIN PIPES.—9 ft. lengths. London Prices. 4 in., 12s. .. 5 in., 15s. .. 6 in., 18s.

IRON—	Per ton in London. £ s. d.		£ s. d.
Common Bars	32 0 0	to	33 0 0
Staffordshire Crown Bars good merchant quality	33 0 0	..	34 0 0
Staffordshire "Marked Bars"	34 0 0	..	35 0 0
Mild Steel Bars	34 0 0	..	35 0 0
Steel Bars, Ferro-Concrete quality, basis price	34 0 0	..	35 0 0
Hoop Iron, basis price	38 0 0	..	40 0 0
" Galvanised	56 0 0	..	60 0 0
Sheet Iron Black—			
Ordinary sizes to 20 g.	48 0 0	..	50 0 0
" " 24 g.	49 0 0	..	51 0 0
" " 26 g.	51 0 0	..	53 0 0
Sheet iron, Galvanised flat, ordinary quality—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	56 0 0	..	58 0 0
Ordinary sizes to 22 g. and 24 g.	57 0 0	..	59 0 0
Ordinary sizes to 26 g.	59 0 0	..	60 0 0
Ordinary sizes to 20 g.	56 0 0	..	58 0 0
" " 22 g. and 24 g.	57 0 0	..	59 0 0
Ordinary sizes to 26 g.	59 0 0	..	60 0 0

METALS (*Continued*).

	Per ton in London. £ s. d.		£ s. d.
Galvanised Corrugated Sheets—			
Ordinary sizes, 6 ft. to 8 ft. 20 g.	58 0 0	..	60 0 0
Ordinary sizes, 22 g. and 24 g.	59 0 0	..	61 0 0
Ordinary sizes, 26 g.	60 0 0	..	63 0 0
Sheet Iron, Galvanised, flat, best quality—			
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	58 0 0	..	60 0 0
Best Soft Steel Sheets, 22 g. and 24 g.	59 0 0	..	61 0 0
Best Soft Steel Sheets, 26 g.	61 0 0	..	62 0 0
Cut Nails, 3 in. to 6 in.	44 10 0	..	45 0 0

(Under 3 in. usual trade extras.)

LEAD, &c.

Delivered in London.

	£ s. d.		£ s. d.
LEAD Sheet, English, 4 lb. and up	54 0 0	..	—
Pipe in coils	54 10 0	..	—
Soil Pipe	57 0 0	..	—
Compo pipe	58 0 0	..	—

NOTE—Country delivery, 30s. per ton extra; lots under 5 cwt., 1s. 6d. per cwt. extra. Cut to sizes, 2s. cwt. extra.

Old lead, ex London area, at Mills ..... per ton	34 0 0	..	—
Do., ex country, carriage forward ..... per ton	35 0 0	..	—
COPPER—			
Strong Sheet ....per lb.	0 2 3	..	—
Thin " .... "	0 2 4	..	—
Copper nails .... "	0 2 3	..	—
Copper wire .... "	0 2 4	..	—
TIN—English Ingots "	0 3 0	..	—
SOLDER—Plumbers' "	0 1 10	..	—
Tinmen's "	0 2 0	..	—
Blowpipe "	0 2 11	..	—

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

	Per Ft.		Per Ft.
15 oz. fourths	8d.	32 oz. fourths	11d.
" thirds	8½d.	" thirds	1/-
21 " fourths	9d.	Fluted, Obscured and Enamelled Sheet,	
" thirds	9½d.	15 oz.	10d.
26 " fourths	10d.	21 "	1/-
" thirds	11d.		

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

	Per Ft.
⅛ Rolled plate	6½d.
¼ Rough rolled and rough cast plate	7½d.
⅜ Rough rolled and rough cast plate	8½d.
Figured Rolled, Oxford Rolled, Baltic, Oceanic Arctic, Stippolyte, and small and large Flemish white	7½d.
Ditto, tinted	9½d.
Rolled Sheet	7d.
White Rolled Cathedral	7d.
Tinted do.	9d.

PAINTS, &c.

		£ s. d.
Raw Linseed Oil in pipes ..... per gallon		0 10 6
" " " in barrels .... "		0 10 6
" " " in drums .... "		0 10 6
Boiled " " in barrels .... "		0 11 0
" " in drums .... "		0 11 3
Turpentine in barrels .... "		0 16 6
" in drums (10 gall.) .. "		0 17 2
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)		90 15 0
GENUINE WHITE LEAD PAINT— "Nine Elms," "Park," "Supremus," and other best brands (in 14 lb. tins) not less than 5 cwt. lots, per ton delivered		110 10 0
Red Lead, Dry (packages extra) .. per ton		65 0 0
Best Linseed Oil Putty ..... per cwt.		1 14 0
Filocol ..... per cwt.		0 18 0
Size. X D Quality ..... firkin		0 3 0

VARNISHES, &c.

	Per gallon. £ s. d.
Oak Varnish ..... Outside	0 18 0
Fine ditto ..... ditto	1 0 0
Fine Copal ..... ditto	1 1 6
Pale Copal ..... ditto	1 2 6
Pale Copal Carriage ..... ditto	1 4 6
Best ditto ..... ditto	1 14 6
Floor Varnish ..... Inside	0 19 0
Fins Pale Paper ..... ditto	0 18 0
Fine Copal Cabinet ..... ditto	1 2 6
Fine Copal flatting ..... ditto	1 0 6
Hard drying Oak ..... ditto	0 18 0
Fine Hard drying Oak ..... ditto	0 19 0
Fine Copal Varnish ..... ditto	1 0 6
Pale ditto ..... ditto	1 2 6
Best ditto ..... ditto	1 14 6
Best Japan Gold Size	0 16 0
Best Black Japan	0 19 0
Oak and Mahogany Stain (water)	0 10 0
Brunswick Black	0 11 0
Berlin Black	0 16 0
Knotting (patent)	1 18 6
French and Brush Polish	1 11 0
Liquid Driers in Terebine	3 19 0
Cuirass Black Enamel	0 7 0

* The information given on this page has been specially compiled for THE BUILDER and is copyright. Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

NEW INVENTIONS.

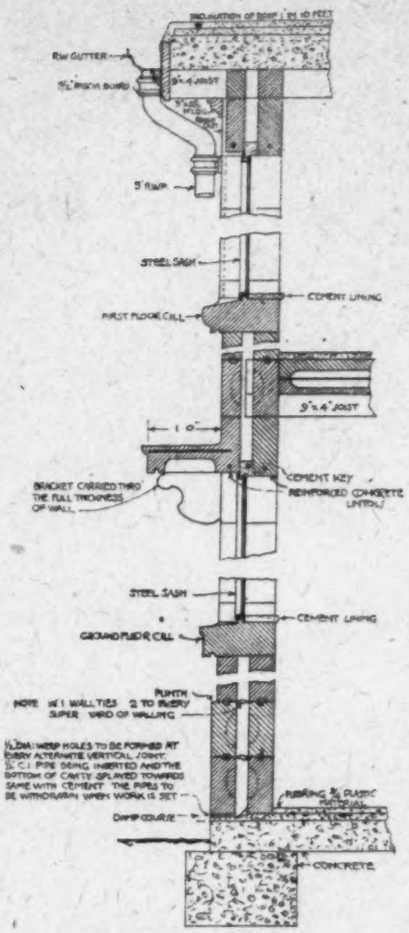
Standardised Concrete Construction.

In this method of concrete construction, the invention of Mr. Arthur F. Jefferies (1a, Margaret-street, Cavendish-square, W.1), the wall blocks and their units, as illustrated on this page, are made complete in one operation in special machines made by Messrs. Vickers, Ltd., to the inventor's design. Thirty complete blocks per man per hour are turned out, the dimensions being 2 ft. 3 in. by 9 in., and in thicknesses of 2 in., 2½ in., 3 in., and 4 in. The external walls are built with a continuous cavity of 2 in.; the outer block or leaf is 3 in. thick with a waterproof face; the inside block is 4 in. thick, finished with a porous face. The wall is tied with ordinary wall ties, 2 per yard super. The blocks are made with two frogs and the centre of the block on elevation is left with a 4 in., and the two extreme ends with a 2 in., width of solid matter; therefore, when the blocks are built together, there is formed at every 13½ in. centre 4 in. of solid matter, which runs perpendicularly through the entire length and height of the wall.

The weight on the foundations is claimed to be about 40 per cent. less than 9 in. solid brickwork, and the blocks are light and easy to handle. It is stated that one cube yard of aggregate will produce 16 yards super. of 3 in. frogged blocks, as compared with 9 yards super. of 3 in. solid cast blocks.

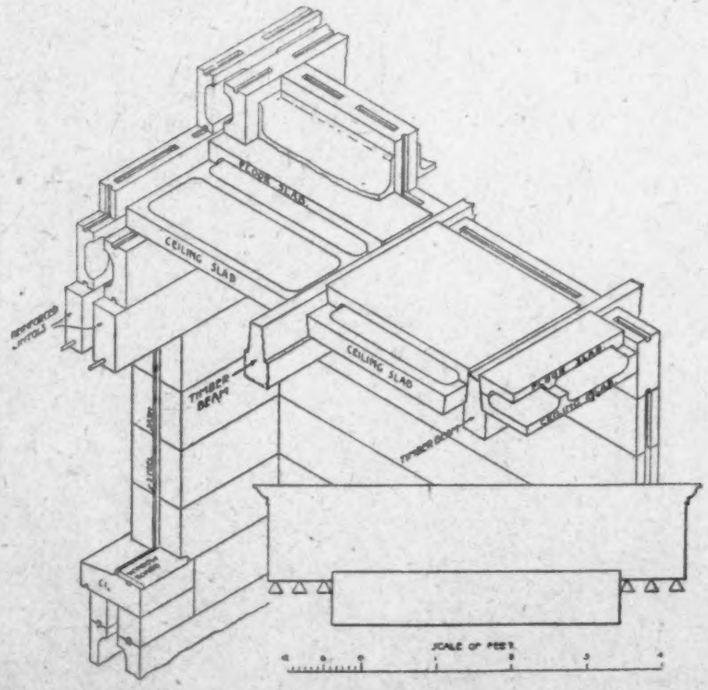
Floors.—The floor blocks are cast in the same manner as the wall blocks, but the sizes are 2 ft. 6 in., 2 ft. 8 in., and 2 ft. 10 in. by 2 ft. wide; the various length dimensions are to enable any width floor to be spanned, avoiding cut bays. The two frogs on each slab, when bedded together, form a concealed chamber which forms a sound-proof and fire-proof block, and as soon as they are laid they are ready for the plastic floor finish. A cone of 3 in. radius is formed completely around the room, and the same material is turned up the wall 5 in. or 6 in. to form a skirting.

The beams are 4 in. by 9 in., which will span 14 ft. and carry a safe load of 1 cwt. per foot super of the floor area. The beams are prepared before being delivered to works, and before being built into position are treated with a special liquid and stained. No trimming is required for hearths or staircase ways, and the whole weight of floors is carried on the inner wall.



The Jefferies System of Concrete Construction.

The whole of a flat roof type house can be erected without a nail or screw, with the exception of the fascia. The system has been approved by the Ministry of Health.



The Jefferies System of Concrete Construction.

BOOKS.

Popular Handbook for Cement and Concrete Users. By M. H. LEWIS, C.E., and A. H. CHANDLER, C.E. London: Hodder and Stoughton. Price 15s. net.

The library of the cement user is already a very large one, but much of our information is highly technical in character and many books of foreign origin deal with a number of subjects outside British interests. The authors' object is to deal with questions of design as well as material in a popular manner and to analyse the cost of different classes of work, and they have succeeded in producing a book of a much more readable nature from the popular standpoint than many treatises with which we have come in contact, the information given being at the same time of a very practical character. After some short opening chapters on the varieties and properties of, and tests for, cements the authors discuss sand and aggregates, and then the proper mixing and placing of concrete. A plea is made for the relative cheapness of concrete work and blocks as against other materials, but on the basis of the present output of labour, anyhow in this country, these statements must be accepted with reserve at the present time. Some chapters dealing with plasters and stuccos are welcome, as are also those on the artistic treatment of concrete, though the only illustration embodying such treatment (p. 104), is a very unhappy one. Two chapters are devoted to the design of beams and slabs, and these are as devoid of mathematics as the subject permits. A very brief review of systems is followed by specific chapters on concrete in construction for foundations, walls, beams, tanks, and as applied generally to different kinds of building. Attention is given to some matters which deserve more consideration from writers on this subject than they often obtain; for example, colouring, waterproofing which is fully dealt with, and the use of white Portland cement. Finally, costs are considered in dissected form, but in dollars, and presumably applicable to American practice. The volume contains a great deal of useful information in a readable form, and should be of value to those interested in this subject.

Five Figure Logarithms and Trigonometrical Functions. By W. E. DOMMETT and H. C. HIRD. London: James Selwyn. Price 1s. 6d. net.

This small paper-covered book contains in its 38 pages the information described in its title, and is compiled to meet the needs of technical students and draughtsmen. The tables are arranged vertically, which is said to be advantageous, and the generally applicable table of differences is printed on a folding sheet set out to be available for any page, which is a great convenience. Both natural and logarithmic tables of trigonometrical function are included. An inexpensive and easily carried book of this kind should be useful, but we think that boards instead of a paper cover would have added to its serviceability.

Rural Housing and Public Utility Societies. By V. A. MALCOLMSON. London: John Murray. Price 6d.

This little work deals with the solving of the housing problem in rural areas, apart from municipal and State enterprise; that is to say, through the medium of public utility housing societies. The facilities given to employers of labour in agriculture or other rural or semi-rural industries under the Housing and Town-Planning Act of 1919 are set forth clearly and briefly, also the "conditions attaching to State assistance," together with the advantages of public utility societies, &c. A pleasant pair of cottages are illustrated, which clearly show how much can be accomplished, both from the artistic and practical point of view, by the unaffected use of local materials, plus a sense of proportion and routine.

TENDERS

Communications for insertion under this heading should be addressed to "The Editor," and must reach him not later than first post on Wednesday.

* Denotes accepted. † Denotes provisionally accepted.
‡ Denotes recommended for acceptance.
§ Denotes accepted subject to modifications.

AYR.—For work in connection with the housing scheme at Georges-avenue for the T.C. :—

*R. Hutchinson, brick, &c., work	£8,810
*J. & D. Meikle, carpenter and joiner work	6,649
*George G. Kirk Ltd., glazier work	103
*J. Meikle & Son, slater roughcast and plumber work	4,377
*Scott & Glen, plaster and cement work	1,655
*P. M'Kerracher & Sons, painter work	646
*W. Auld & Sons, electric lighting	448

BATH.—For supply of road materials to the Corporation :—

*Roadstone Supply Co., Shepton Mallett—2,500 tons of 2 in. or 2½ in. machine broken limestone, at 11s. 11d. per ton.
*Imborough Stone Co., Ltd.—1,000 tons of 2 in. or 2½ in. machine broken limestone, at 11s. 11d. per ton.
*Read & Son, Gurney Slade—500 tons of 2 in. or 2½ in. machine broken limestone, at 11s. 11d. per ton.
*Black Rock Limestone Quarries, Ltd., Bristol—500 tons of 2 in. or 2½ in. machine broken black rock, at 14s. 7d. per ton.
*Cae Hill Dhu Stone Co.—1,500 tons of 2 in. machine broken granite, at 21s. 7d. per ton.
*Roadstone Supply Co.—2,000 tons gravel, at 12s. 11d. for fine and 12s. 5d. for coarse.

BELFAST.—For alterations at Clerk's Office, for the R. G. Mr. James Murray, Clerk of Works, Belfast Union :—

*James Calwell, Belfast £445

BLACK NOTLEY.—For improvements to sewage disposal system at Sanatorium, for the Essex C.C. :—

*Hawkes, Chelmsford £269

BRAINTREE.—Repair of Hoppit Bridge, for the Essex C.C :—

*A. J. Arnold, Chelmsford £415

BUCKHAVEN.—For work in connection with the Buckhaven and Methil housing schemes, for the T.C. :—

Brickwork—*Robt. Durie & Son, Methil, £12,719 16s. 9d. for Buckhaven and £22,316 13s. 4d. for Methil.
Plaster and Cement work—*J. & T. Stobie, Buckhaven, £1,923, and *A. & J. Howie, Leven, £3,000 4s. for Methil.
Slater work—*A. & J. Howie, Leven, £2,083 9s. 1d. for Buckhaven, and £3,263 6s. 8d for Methil.
Plumber and Gasfitting—*A. Thomson & Co., Dunfermline, £3,309 13s 4d. for Buckhaven and £6,075 9s. 6d. for Methil.
Joiner work—*David Dewar, Methil, £15,878 16s. for Buckhaven and £8,782 3s. for Methil.
Painter work—*J. C. Rolland, Edinburgh, £895 11s. 6d. for Buckhaven, and *T. Macfarlane, Methil, £1,626 14s. 7d. for Methil.

CHELTENHAM.—For the erection of houses for the T.C. :—

*A. C. Billings & Sons—10 concrete houses at £947 per house, and 20 brick houses at £949 per house.
*Collins & Godfrey—10 concrete houses at £947 per house, and 20 brick houses at £949 per house.
*W. Drew—20 brick houses at £949 per house.
*C. H. Ranger & Sons—20 brick houses at £949 per house.

CHESTER.—For the erection of the dwelling houses and out-buildings at Wilmslow, Birkenhead, Nantwich, Andlem, Chester, Tarvin and Northwich, for the County Council of Chester :—

*H. G. Dykes, Buertan (No. 2) Estate, Andlem.
*L. Brown & Sons, Newton Estate, Wilmslow.
*G. Cash & Sons, Upton Estate, Chester.
*Henry Jones, Hunlestow Estate, Crewe.
*G. W. Platt, Buertan Estate (No. 1), Crewe.
*G. Cash & Sons, Huntington Estate, Aston-by-Budworth Estate, Barrow Estate, Chester.
*S. Manley, Broomhall Estate, Nantwich.

DERBY.—For drainage work at the Institution of the Board of Guardians :—

*J. H. Fryer £920

DUDLEY.—Tenders accepted by T.C. :—

*Taplin & Holland, reconstruction of sewer, Halesowen-road	£906 10 0
*Martin & Element, reconstruction of sewer, Blowers-green	420 16 8
*Currall, Lewis & Martin construction of pumping-house at Red-hill	845 0 0
*Thorpe, cast-iron rising main at Red-hill	674 0 6
*Pulsometer Engineering Co., supply of pumping-plant	1,112 0 0

ELTHAM.—For repairs &c., to the Workhouse and to two cottages, for the Board of Guardians :—

*Clayson, Lyminge	£5,343 14 6
Cook & Parker	6,856 11 0
Hayward & Paramor	6,454 10 0
Jenner & Son	7,562 8 7
S. Vant	6,692 2 6
J. G. Parsons & Sons	6,672 3 0

EPPING.—For erection of 20 houses at Nazing, for the R.D.C. :—

*Ekins, London £16,943

ESSEX.—For erection of small holders' cottages, for the Essex C.C. :—

*A. E. Farr, Kelvedon, Gray's-hill one pair	£2,100 0 0
*A. E. Farr, Kelvedon, Coggeshall-road, one pair	1,950 0 0
*W. Green, Weeley, one pair	1,916 14 6
*Valentine, Cressing, single cottage	965 6 6

FOLKESTONE.—For erection of 24 houses for the T.C. :—

*Parsons & Son, A Type.....£776 per house
B Type..... 904 „ „

GOSFORTH.—For erection of cart and motor lorry sheds at North Depot, Regent Pit, Gosforth, for the U.D.C. Mr. Geo. Nelson, Engineer and Surveyor. Council Offices, Gosforth. Quantities by Mr. Geo. Nelson :—

*Wm. C. Fleck, Gosforth	£1,567 2 5
E. McNeil, Gosforth	2,522 0 0

GRANTHAM.—For the erection of twelve cottages at Woolsthorpe-by-Belvoir, for the Grantham R.D.C. Mr. H. C. Rudkin, P.A.S.I., 4, St. Peter's-hill, Grantham :—

*Mr. F. P. Ponter, Grantham	£9,318 0 0
*Mr. F. W. Ponter, Drainage, &c.	969 6 0
Mr. T. Denman, Melton Mowbray	11,070 0 0
Mr. T. Denman, Drainage and Water Supply	1,060 0 0
Rudd & Son, Grantham	10,500 0 0
Rudd & Son, Drainage, &c.	1,280 0 0

GREAT GONERBY, GRANTHAM.—For drainage, water supply, &c., and erection of sixteen cottages at Great Gonerby, for Grantham R.D.C. Mr. H. C. Rudkin, P.A.S.I., 4, St. Peter's-hill, Grantham :—

Houses :—

‡Parkes & Son	£12,160 16 8
Brown & Co.	12,205 18 0
Rudd & Son	12,249 0 0
Drainage and Water Supply :—	
‡Parkes & Son	£2,008 10 9
Brown & Co.	2,058 11 0
Rudd & Son	2,118 0 0

HERNE BAY.—Residence at Albury Drive. Mr. Alfred E. Nightingale, architect, Herne Bay and London :—

*Rice & Son, Margate and London	£2,812
Eastlake, Ltd., London	3,362
J. Brown, Herne Bay	2,820

GODALMING.—Erection of Highdown Sanatorium, for the Metropolitan Asylums Board :—

	Tender for Work as specified.	With slated roofs at lower angle instead of tiled roofs.	With ferro-concrete walls instead of brick for nurses' block.	With ferro-concrete walls instead of brick for one-storied bldgs. at power statn.
		Decrease.	Decrease.	Decrease.
*Chessums, Ltd	£188,130	£3,245	£285	£236
Walter Lawrence & Son, Ltd., Finsbury	195,642	3,721	271	263
Holloway Bros. (London), Ltd., Westminster	196,996	3,325	272	245
Prestige & Co., Ltd., Westminster	199,191	3,000	Nil	Nil
				Increase.
Parker, Geo. & Sons, Ltd.	199,961	3,734	168	69
				Decrease.
Holliday & Greenwood, Ltd., S.W.	205,450	3,100	200	250

LONDON.—For the conversion into flats of the houses Nos. 63 and 65, Highbury-hill, 7 and 8, Charles-street, and 19, Highbury-terrace, for the Islington B.C. :—

	63 & 65 Highbury-hill.	7 & 8 Charles-street.	19 Highbury-terrace.
*Geo. Bennett, N.4	£2,633	£1,123	£1,232
*F. Randall & Sons, Holloway	—	1,026	1,765
Thos. Shillitoe, Norwood	3,200	1,075	1,745
Adams & Co., Finsbury	—	1,250	—
Heath, Ltd., Kensington	3,222	—	2,055
V. J. Wagstaff, N.	3,780	—	2,400
J. Cooper, N.	3,850	—	2,510
Negus, Ltd., E.C.	3,880	—	2,160
J. C. Mather, N.	—	—	2,186
Slade & Co., Barnsbury Park	6,321	2,128	3,898

*Mr. Bennett's tender is accepted for Highbury-hill and Highbury-terrace, and that of Messrs. Randall for Charles-street.

LONDON.—For erection of block of 64 flats and crèche in Prince of Wales-road, for the St. Pancras B.C. :—

	Flats.	Decrease if artificial stone is used.	Crèche.
*Chessums, Ltd., Tottenham	£79,374 8	£1,439 14	£3,600 10
J. W. Falkner & Son, S.E.1	83,740 0	1,357 0	3,893 0
C. Miskin & Sons, Ltd., St. Albans	88,000 0	1,550 0	4,000 0
Holliday & Greenwood, Ltd., Battersea	88,320 0	1,000 0	4,050 0
L. & W. Whitehead, Ltd., Clapham	89,673 0	1,050 0	4,075 0

MARGATE.—For the erection of 90 houses on the Connaught-road site. Mr. W. R. H. Gardner, architect, 12, Grosvenor-place, Margate. Quantities by Mr. J.T. Wyatt, 56, Buckingham Gate, S.W. :—

	Type A.			Type B.		Type B4.	Type B.		Total No. Cottages Tendered for.	Total.
	Bill No. 2. Pair A.1.	Bill No. 3. Block A.1.	Bill No. 4. Pair A.2.	Bill No. 5. Pair B.1.	Bill No. 6. Pair B 3.	Bill No. 7. Pair B 4.	Bill No. 8. Pair M. of H.	Bill No. 9. Fences.		
T. Lester, Margate	£1,590 13 4	£3,094 10 0	£1,503 0 0	£1,769 0 0	—	£1,849 0 0	—	—	20	£16,982 0 0a
Chessums, Ltd., London	1,702 1 10	3,353 9 0	1,511 9 3	1,900 17 3	1,966 6 0	2,025 15 0	2,001 13 0	1,101 13 0	70	63,920 17 [illegible]b
J. W. Ellingham, Dartford	1,770 0 0	3,500 0 0	1,580 0 0	2,000 0 0	2,050 0 0	2,110 0 0	2,120 0 0	800 0 0	70	66,450 0 0
Woods & Stoner, Margate	1,881 10 3	3,533 12 10	1,603 10 4	1,951 11 1	2,107 10 0	2,114 19 8	2,020 13 3	1,379 18 7	70	67,928 18 6
Taylor & Co., Harlesden	1,880 0 0	3,773 0 0	1,685 0 0	2,014 0 0	2,153 0 0	2,198 0 0	2,381 0 0	1,373 0 0	70	68,500 0 0
Rice & Son, Stockwell	1,842 4 8	3,612 15 6	1,658 16 9	2,067 7 6	2,105 17 4	2,196 15 8	2,174 15 4	826 15 0	70	66,944 17 5
R. Young Construction Co., London	1,910 0 0	3 720 0 0	1,750 0 0	2,120 0 0	2,200 0 0	2,301 0 0	2,297 0 0	871 0 0	70	1,615 0 6
London Building Co., London	—	—	—	—	—	—	—	—	70	62,529 0 0d
C. & A. Clarke, Margate	—	—	—	—	—	—	—	428 15 0c	—	—

a. Recommended for acceptance
b. „ „ „ (less fencing).
c. „ „ „ (Does not include the whole of the work to fencing).
d. Clinker block construction, Winget system. (Not a "firm" tender).

LIVERPOOL.—For cleaning, painting, &c., at the City Hospital East, for the Corporation :—
*Tipping Bros, Walton £986 15

LIVERPOOL.—For repainting, &c., the exterior of dwelling-houses in Chatham-street, Bedford-street, Falkner-street, Grove-street, Cambridge-street, and Myrtle-street, for the T.C. :—
*Pierce Williams & Son, Liverpool, Bedford-street and Falkner-street £329 15 0
*W. & A. Piercy, Ltd., Liverpool, Chatham-street 134 17 6
*W. Clarkson, Everton, Grove-street 226 0 0
*F. Gaskin & Son, Liverpool, Cambridge-street 138 10 0
*James Bland & Son, Liverpool, Myrtle-street 164 1 8

LONDON.—For various works for the Metropolitan Asylums Board :—
Hackney Casual Ward—(a) Internal cleaning, painting and repairs—
*Douglas Halse & Co., Ltd., Woolwich £755 0 0
Crowley & Dawe, Chelsea .. 809 14 0
Hudson Bros., Walthamstow .. 1,171 7 1
British Renovating Co., Ltd., Canning Town 1,320 18 3
W. Ellis & Co., E.C. 1,450 0 0
Engineer-in-Chief's estimate .. 960 0 0
(b) Re-surfacing road with tar macadam—
*A. C. W. Hobman & Co., Ltd., Bermondsey 136 11 6
T. Adams, Wood Green .. 155 0 0
Chittenden & Simmons, Ltd., Maidstone 245 0 0
Engineer-in-Chief's estimate .. 170 0 0
Joyce Green Hospital—(a) New fuel economiser—
*E. Green & Son, Ltd., Wakefield 1,016 0 0
A. Lowcock, Ltd., Shrewsbury 1,038 10 0
Goodbrand & Co., Ltd., Stalybridge 1,070 12 0
Engineer-in-Chief's estimate .. 875 0 0
(b) Brickwork settings for new fuel economiser—
*Reading Boiler Setting Co., Reading 377 10 0
H. Windsor & Co., Ltd., Fulham 488 0 0
O. M. Keevil, St. James-place, Dartford 621 13 9
Engineer-in-Chief's estimate .. 350 0 0

PLYMOUTH.—For private street works in Home Park-avenue, Beechcroft-road, and the lane between Fleet and Admiralty-streets, for the T.C. :—
*T. Doney & Son at £1,407 9s. ; £1,885 15s. ; and £1,214 10s. respectively.

PLYMOUTH.—The T.C. has accepted the following offers for the erection of houses :—
*E. E. Endicott, agent for Dorman Long & Co. two houses at £804 per house.
*Maxwell & Wright, two houses at £775 per house.
*F. J. Stanbury ..... 16 houses £24,618
*A. N. Coles & Son ....32 „ 31,936

ROTHERHAM.—Adaptation of premises in Westgate, &c., for common lodging house, for the T.C. :—
*Chadwick & Co. (Rotherham), Ltd. £1 869 10

RUGELEY.—For erection of houses on the Sandyfane estate, for the U.D.C. :—
*C. J. Moore .....£864 per house.

SALFORD.—The following tenders have been accepted by the T.C. :—
*Buxton Lime Firms Co., supply of 1,400 tons of lime at 42s. 2d. per ton.
*Partington Steel & Iron Co., Irlam, supply of 51,850 tons of slag for filtering medium, £22,036 5s.
*Penmaenmawr & Welsh Granite Co., Ltd., Liverpool, granite setts, £3 19s. 6d. per ton.
*Carnarvon Granite Co., Runcorn, broken granite (1½ in.), £1 1s. 8d. per ton.
*Ditto., granite screenings (½ in.), £1 0s. 8d. per ton.
*Ditto., granite screenings (¼ in.), £1 1s. 8d. per ton.
*Henry Heys & Co., Ltd., Stacksteads, sawn barns flags and grit curbs, schedule of prices.
*The Buxton Lime Firms Co., Ltd., Buxton, Buxton lime, £2 6s. 6d. per ton.
*Ditto., Limestone chippings, schedule of prices.
*John Needham & Sons, Ltd., Stockport, cast-iron materials, schedule of prices.
*Carnarvon Granite Co., Runcorn, broken granite (2½ in.), £1 1s. 8d. per ton.

SEDGEFIELD.—For the external painting of the Council houses, Northside-terrace, Trimdon Grange, for the Sedgefield R.D.C. Mr. Jas Stones, Union Offices, Sedgefield. :—
*W. T. Rce, Trimdon Grange £123 0 0
A. Plant, West Hartlepool 199 16 0
James Burdon, Ltd., West Hartlepool 240 0 0
W. Raper, Norton-on-Tees 289 7 6

SEDGLEY.—For the erection of 800 houses, for the U.D.C. :—

	Per house.
Brecon Site (400 *houses*).	
*Wilson, Lovatt & Sons, Wolverhampton	£986 11 2
E. Clark, Melton Mowbray ..	1,093 13 6
A. & S. Wheater, London ..	963 7 0
Concrete Homes, Ltd.	1,063 0 0
A. J. Crump, Dudley	1,071 10 0
*Total tender accepted, £394,623 12 8.	
Lay-out of Brecon Site,	
*Wilson, Lovatt & Son ..	£31,272 15 11
Jeevons & Co, ...	41,863 9 8
Ernest Clarke	33,960 0 0

The Council decided to accept also the tender of Messrs. Wilson, Lovatt & Son for the lay-out of the Clarence-street and Sumner-lane sites, and to entrust to the local federated builders the erection of 400 houses on these sites.

SITTINGBOURNE.—For the erection of fifty houses in Bell-road, for the U.D.C. Mr. T. F. W. Grant, architect, 11 Buckingham-street, W.C. 2. Quantities by Mr. W. L. Grant, Sittingbourne.
*E. Bishop & Sons, Sittingbourne .. £12,362
Twelve houses only.

STONE.—For repairs to Chelsey Bridge, for the R.D.C. :—
*F. Bladon £275

STROUD.—Extensions to the Marling School, Stroud, for the Gloucestershire E.C. Mr. R. S. Phillips, Education Architect, Shire Hall, Gloucester :—
Contract No. 1 (Foundations, brickwork, &c.) :—
*Orchard & Peer, Stroud £2,280
Contract No. 2 (Superstructure)—
*A. S. Cooke, Stroud 8,250

TEIGNMOUTH.—For foundation work and housing of gas plant for U.D.C. Mr. H. Higham, Gas Engineer, Teignmouth :—
Blunt Bros., Ltd., Teignmouth : A. Best, Ltd.
The Council has decided to carry out this work departmentally.

WELLINGBOROUGH.—For erection of two public conveniences in the gardens at "Swanpool," for the U.D.C. :—
*Hackaley Bros., Wellingborough £960 12 9
W. G. Quartermaine, Wellingborough 960 12 9
†C. A. Harrison, Wellingborough 915 0 0
†C. Adams, Wellingborough 820 0 0
† *Withdrawn.*

WISBECH.—For erection of four pairs of houses at Christchurch. Mr. F. Burdett Ward, M.S.A., architect, 8, South Brink, Wisbech.
*Elsworthy & Co., Upwell £6,946 1 4

WISBECH.—For the erection of 40 houses in 4 pairs and 8 blocks of 4 on the Elm-road site, for the T.C. Mr. F. Burdett Ward, M.S.A., architect, 8 South Brink, Wisbech :—
†H. Rands & Son, Ltd., Elm-road £34,356
Accepted subject to modifications.

WORTHING.—For erection of 130 houses, for the T.C. :—
*F. Sandell & Sons ..... £785 per house

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